Access DB# 85202

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: [illegible] Examiner #: 78173 Date: 01/27/03

Art Unit: 1661 Phone Number 30[illegible]27 Serial Number: 10/010,249

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9572

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Method of obtaining desiccation of ornamental plant from [illegible]

Inventors (please provide full names): Zhang Jin wei, Ernesto Leon, Agustin Oviedo

Earliest Priority Filing Date: 13 November 2000

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

elicitor protein polypeptide → plant pathogen

desiccation ornamental plant.

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: Alex Wadlow	NA Sequence (#)	STN $377.00
Searcher Phone #: [illegible]	AA Sequence (#)	Dialog
Searcher Location: [illegible]	Structure (#)	Questel/Orbit
Date Searcher Picked Up: 1/27/03	Bibliographic	Dr.Link
Date Completed: 1/27/03	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 11	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 1	Other	Other (specify)

PTO-1590 (1-2000)

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=> fil wpids
FILE 'WPIDS' ENTERED AT 11:58:23 ON 27 JAN 2003
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FILE LAST UPDATED:          24 JAN 2003      <20030124/UP>
MOST RECENT DERWENT UPDATE:     200306        <200306/DW>
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     (FILE 'HCAPLUS' ENTERED AT 11:52:21 ON 27 JAN 2003)
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     FILE 'WPIDS' ENTERED AT 11:53:11 ON 27 JAN 2003
L1          3206 S DESSICCAT? OR DESICCAT?
L2        220263 S PLANT#
L3        133061 S PROTEIN# OR PEPTIDE# OR POLYPEPTIDE#
L4            59 S L3 (S) ELICITOR?
L5          1308 S L3 (S) ELICIT?
L6           400 S L1 AND L2
L7            24 S L3 AND L6
L8             3 S L7 AND (L4 OR L5)
L9           179 S ENHANC? (S) LONGEV?
L10            2 S L9 AND L2 AND (L4 OR L5)
L11            3 S L10 OR L8
L12        10605 S CLAVIBACTER OR ERWINIA OR PHYTOPHTHORA OR PSEUDOMONAS OR RALS
L13           52 S L12 AND (L4 OR L5)
L14            3 S L13 AND (L1 OR L9)
L15            3 S L14 OR L11
L16           48 S L4 AND L2
L17           24 S L16 AND L12
L18           21 S L17 NOT L15

     FILE 'WPIDS' ENTERED AT 11:58:23 ON 27 JAN 2003

=> d .wp l15 1-3

L15  ANSWER 1 OF 3  WPIDS (C) 2003 THOMSON DERWENT
```

AN 2002-575194 [61] WPIDS
DNC C2002-162847
TI Inhibiting **desiccation** of cuttings from ornamental **plants**, by treating ornamental **plants** with hypersensitive response **elicitor protein**, or expressing heterologous hypersensitive response **elicitor protein** in **plants**.
DC C06 D16
IN LEON, E; OVIEDO, A; WEI, Z
PA (EDEN-N) EDEN BIOSCIENCE CORP
CYC 97
PI WO 2002037960 A2 20020516 (200261)* EN 69p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2002036469 A 20020521 (200261)
ADT WO 2002037960 A2 WO 2001-US43715 20011106; AU 2002036469 A AU 2002-36469 20011106
FDT AU 2002036469 A Based on WO 200237960
PRAI US 2000-248169P 20001113
AB WO 200237960 A UPAB: 20020924
NOVELTY - Inhibiting (M1) **desiccation** of cuttings from ornamental **plants** (I), involves treating (I) with a hypersensitive response **elicitor protein** or **polypeptide** (II), or providing a transgenic ornamental **plant** (P1) or **plant** seed transformed with a DNA molecule encoding (II), and growing P1 or transgenic ornamental **plant** (P2) produced from the transgenic ornamental **plant** seed.

DETAILED DESCRIPTION - M1 involves: (a) treating (I) with (II) under conditions effective to inhibit **desiccation** of a cutting from (I), after the cutting is removed from (I); or (b) providing P1 or **plant** seed transformed with a DNA molecule encoding (II), and growing P1 or P2 under conditions effective to inhibit **desiccation** in a cutting removed from the transgenic **plant**.

INDEPENDENT CLAIMS are also included for the following:

(1) a cutting (IIIa) which has been removed from (I) treated with (II), where the cutting is characterized by greater resistance to **desiccation** as compared to a cutting removed from an untreated ornamental **plant**;

(2) promoting (M2) early flowering of (I), by treating (I) with (II), or by providing P1 or **plant** seed transformed with a DNA molecule encoding (II), and growing P1 or P2;

(3) harvesting (M3) a cutting from (I), by: (a) treating (I) with (II), and harvesting a cutting from the treated ornamental **plant**; (b) harvesting a cutting from (I), and treating the harvested cutting with (II); or (c) providing P1 or **plant** seed transformed with a DNA molecule encoding (II), and growing P1 or P2 produced from the transgenic ornamental **plant** seed under conditions, and harvesting a cutting from the grown transgenic ornamental **plant**, where the cutting exhibits a reduced susceptibility to **desiccation** as compared to cuttings removed from non-transgenic ornamental **plant**;

(4) a cutting (IIIb) which has been removed from a transgenic ornamental **plant** which expresses (II), where the cutting is characterized by greater resistance to **desiccation** as compared to a cutting removed from a non-transgenic ornamental **plant**; and

(5) **enhancing** (M4) the **longevity** of flower blooms

on ornamental **plant** cuttings, by: (a) providing P1 or **plant** seed transformed with a DNA molecule encoding (II), and growing P1 or P2; (b) treating (I) with (II); or (c) harvesting a cutting from (I) and treating the harvested cutting with (II).

ACTIVITY - None given.

MECHANISM OF ACTION - Dessication inhibitor; **Longevity enhancer**.

Mature rose **plants** were treated with Messenger (coded as EBC-151) by foliar sprays and postharvest treatment to improve flower quality and longevity. The trial was established in a commercial rose greenhouse. The rose variety in this trial was Vega. Individual plot beds contained approximately 44 mature **plants** arranged in two rows; each plot was replicated 4 times and measured 80 cm wide by 15.4 m long. EBC-151 treatments were applied with a CO2-powered backpack sprayer calibrated to deliver 430 1/Ha at 90 psi. Preharvest applications of each EBC-151 treatment were repeated at approximately 14-d intervals. After the fifth preharvest application, 10 mature flower/stems were randomly selected from each treatment and evaluated. Treatment effects were evaluated on cut flowers by assessing the number of open flowers and the number of straight stems on each flower/stem. No preharvest applications of EBC-151 were made to flower/stems harvested after the fifth application of EBC-151. Visual observations of cut roses 16 days after postharvest treatment were made for treatments that received postharvest applications of EBC-151. Roses that had been treated with the postharvest application of EBC-151 appeared to have substantially greater longevity than those that had not received the postharvest treatment. Results of this trial demonstrated a treatment effect for application of EBC-151 Messenger to roses. The effect was seen in a substantially greater increase in the number of open flowers at harvest. This effect is of significant commercial benefit to rose growers. In addition, the postharvest application of EBC-151 to cut roses resulted in substantially extending the shelf life of the cut roses.

USE - (II) is useful for inhibiting dessication of cuttings from ornamental **plants**, for harvesting cutting from ornamental **plants**, for promoting early flowering of ornamental **plants** , and **enhancing** the **longevity** of flower blooms on ornamental **plant** cuttings (claimed).

ADVANTAGE - (II) can be easily expressed transgenically in or applied topically to ornamental **plants** or cuttings, hence it offers an effective, simple-to-use, non-toxic approach for inhibiting dessication of cuttings from ornamental **plants**, for harvesting cutting from ornamental **plants**, for promoting early flowering of ornamental **plants**, and **enhancing** the **longevity** of flower blooms on ornamental **plant** cuttings. By inhibiting dessication of cuttings are less likely to wilt and die before they are received by the retailer. This will dramatically decrease losses associated with long transportation rates in less than ideal conditions.

Dwg.0/3

TECH UPTX: 20020924

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: (II) is derived from a **plant** pathogen e.g. **Erwinia**, **Pseudomonas**, **Ralstonia**, **Xanthomonas**, **Clavibacter**, and **Phytophthora**. M1 further involves removing a cutting from the treated ornamental **plant** and applying (II) to the removed cutting. The cutting comprises stem, leaf, flower or their combinations. (II) is expressed in flower tissues of the cutting.

L15 ANSWER 2 OF 3 WPIDS (C) 2003 THOMSON DERWENT

AN 2002-257464 [30] WPIDS

CR 2000-328939 [26]

DNC C2002-076625
TI New **Xanthomonas** hypersensitive response **elicitor protein**, useful for imparting disease resistance to **plants**, enhancing **plant** growth and controlling insects in **plants**.
DC C06 D16 P13
IN FAN, H; SWANSON, S S; WEI, Z
PA (FANH-I) FAN H; (SWAN-I) SWANSON S S; (WEIZ-I) WEI Z; (EDEN-N) EDEN BIOSCIENCE CORP
CYC 94
PI WO 2002012293 A2 20020214 (200230)* EN 61p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
US 2002066122 A1 20020530 (200240)
AU 2001078063 A 20020218 (200244)
ADT WO 2002012293 A2 WO 2001-US23787 20010727; US 2002066122 A1 Provisional US 1998-103124P 19981005, CIP of US 1999-412452 19991004, Provisional US 2000-224053P 20000809, US 2001-829124 20010409; AU 2001078063 A AU 2001-78063 20010727
FDT AU 2001078063 A Based on WO 200212293
PRAI US 2001-829124 20010409; US 2000-224053P 20000809; US 1998-103124P 19981005; US 1999-412452 19991004
AB WO 200212293 A UPAB: 20020711
NOVELTY - An isolated **Xanthomonas** hypersensitive response (XcpHR) **elicitor protein** (I) comprising a sequence (S1) of 114 amino acids fully defined in the specification, or a **protein** encoded by a DNA that hybridizes to a complement of a sequence (S2) comprising 342 nucleotides fully defined in the specification, in hybridization medium comprising 2X standard saline citrate (SSC), 0.1% sodium dodecyl sulfate (SDS) at 56 deg. C, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) an isolated DNA molecule (II) encoding (I);

(2) an expression vector (III), a host cell (IV), a transgenic **plant** (V) or a transgenic **plant** seed (VI), all transformed with (II);

(3) a cutting (VII) removed from (V) (an ornamental **plant**), and characterized by greater resistance to **desiccation** as compared to a cutting removed from a non-transgenic ornamental **plant**, where the cutting or the ornamental **plant** is treated with (I);

(4) a transgenic **plant** (Va) comprising a first DNA molecule encoding a transcript or a **protein** or **polypeptide** that confers a trait, and a second DNA molecule encoding (I), which is different than the **protein** or **polypeptide** encoded by the first DNA molecule;

(5) a transgenic **plant** seed obtained from (Va);

(6) applying (I) to a **plant** or **plant** seed comprising a transgene conferring a transgenic trait; and

(7) providing a **plant** cell, transforming the **plant** cell with a first DNA molecule encoding a transcript or a **protein** or **polypeptide** which confers a trait to a **plant** grown from the transformed **plant** cell, and a second DNA molecule encoding (I), under conditions effective to produce a transgenic **plant** cell, and regenerating a transgenic **plant** from the transformed **plant** cell.

ACTIVITY - None given.
MECHANISM OF ACTION - Enhances **plant** growth; inhibits **desiccation** of cuttings from ornamental **plants**; promotes early flowering of ornamental **plants** (claimed). Tomato seeds were soaked in solution containing the XcpHR elicitor for more than 4 hours. Seeds soaked in the same solution without the elicitor served as a control. The elicitor treated **plants** were observed to have 15-20% greater average growth than the control **plants**.
USE - (I) and (II) are useful for imparting disease resistance to **plants**, enhancing **plant** growth, providing insect control for **plants**, imparting stress resistance to **plants**, inhibiting post-harvest disease or **desiccation** of a fruit or vegetable, inhibiting **desiccation** of cuttings from ornamental **plants**, harvesting a cutting from an ornamental **plant**, and promoting early flowering of an ornamental **plant**. (I) or (II) is also useful for providing disease resistance, insect resistance, enhanced growth, herbicide resistance, stress tolerance, male sterility, modified flower color and biochemically modified **plant** product in transgenic **plants** given in the specification (claimed).
ADVANTAGE - (I) provides greater yield, increased percentage of seeds germinated, increased **plant** size, greater biomass, more and bigger fruit, earlier fruit coloration, earlier flower opening, improved flower longevity (i.e. shelf-life), and earlier fruit and **plant** maturation. As a result, (I) provides significant economic benefit to growers. (I) enables produce growers, warehouse packers, shippers and suppliers to process, handle, and store fruits and vegetables with reduced losses caused by post-harvest disease and **desiccation**.
Dwg.0/1

TECH UPTX: 20020513
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preparation: (I) and (II) are produced by standard recombinant techniques.
Preferred Sequence: (II) comprises a DNA molecule encoding S1, a DNA molecule which hybridizes to a DNA molecule complementary to a nucleotide sequence comprising S2 in a hybridization medium comprising 2X SSC, 0.1% SDS at 56 degrees C, or a DNA molecule complementary to the above said DNA molecules. (II) is in sense orientation and correct reading frame.
Preferred Host Cell: (IV) is a **plant** or bacterial cell, in which (II) is transformed with (III).
Preferred Transgenic **Plant**: In (Va), the first DNA molecule encodes a **protein** or **polypeptide** selected from any one of the **proteins** given in the specification, e.g. Bacillus thuringiensis toxin, Photorhabdus luminescens **protein**, protease inhibitors, etc. The first DNA molecule encodes a transcript selected from antisense RNA and sense RNA.

L15 ANSWER 3 OF 3 WPIDS (C) 2003 THOMSON DERWENT
AN 2002-041357 [05] WPIDS
DNC C2002-011737
TI Inhibiting post harvest disease (caused by Penicillium, Botrytis, **Phytophthora**, or **Erwinia**) or **desiccation** and **enhancing** the **longevity** in a fruits or vegetables, using hypersensitive response **elicitor proteins** or nucleic acids.
DC C06 D16
IN QIU, D; REMICK, D; WEI, Z
PA (QIUD-I) QIU D; (REMI-I) REMICK D; (WEIZ-I) WEI Z; (EDEN-N) EDEN BIOSCIENCE CORP
CYC 95
PI WO 2001080639 A2 20011101 (200205)* EN 66p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ

NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

US 2002019337 A1 20020214 (200214)
AU 2001053593 A 20011107 (200219)
EP 1274307 A2 20030115 (200306) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

ADT WO 2001080639 A2 WO 2001-US12468 20010417; US 2002019337 A1 Provisional US 2000-198359P 20000419, US 2001-835684 20010416; AU 2001053593 A AU 2001-53593 20010417; EP 1274307 A2 EP 2001-927112 20010417, WO 2001-US12468 20010417

FDT AU 2001053593 A Based on WO 200180639; EP 1274307 A2 Based on WO 200180639

PRAI US 2000-198359P 20000419; US 2001-835684 20010416

AB WO 200180639 A UPAB: 20020123

NOVELTY - Methods for inhibiting post harvest disease or **desiccation** and **enhancing** the **longevity** in a fruits or vegetables, using hypersensitive response **elicitor proteins** or **polypeptides** or nucleic acids derived from pathogens (**Erwinia** (E. amylovora, E. stewartii, E. chrysanthemi, E. carotovora), **Xanthomonas**, **Pseudomonas** (P. syringae, P. solanacearum), **Phytophthora** (especially), and **Clavibacter**), are new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) a method (I) of inhibiting post harvest disease or **desiccation** in a fruit or vegetable, comprising treating a fruit or vegetable with a hypersensitive response **elicitor protein** or **polypeptide** under conditions effective to inhibit post harvest disease or **desiccation**;

(2) a method (II) of inhibiting post harvest disease or **desiccation** in a fruit or vegetable, comprising providing a transgenic **plant** or **plant** seed transformed with a DNA molecule encoding a hypersensitive response **elicitor polypeptide** or **protein** and growing the transgenic **plant** or transgenic **plant** produced from the transgenic **plant** seed under conditions effective to inhibit a post harvest disease or **desiccation** in a fruit or vegetable harvested from the transgenic **plant**;

(3) a DNA construct (III) comprising:

(a) a DNA molecule encoding a hypersensitive response **elicitor protein** or **polypeptide**;

(b) a **plant**-expressible promoter operably coupled 5' to the DNA molecule (the promoter being effective to transcribe the DNA molecule in fruit or vegetable tissue); and

(c) a 3' regulatory region operably coupled to the DNA molecule (expression of the DNA molecule in fruit or vegetable tissue imparts to a fruit or vegetable resistance against post harvest disease or **desiccation**);

(4) an expression system (IV) comprising a vector into which is inserted the heterologous DNA construct (III);

(5) a host cell (V) comprising the heterologous DNA construct (III);

(6) a transgenic **plant** (VI) comprising the heterologous DNA construct (III);

(7) a method (VII) of **enhancing** the **longevity** of fruit or vegetable ripeness comprising treating a fruit or vegetable with a hypersensitive response **elicitor protein** or **polypeptide** under conditions effective to **enhance** the

longevity of fruit or vegetable ripeness; and

(8) a method (VIII) of **enhancing** the **longevity** of fruit or vegetable ripeness comprising providing a transgenic **plant** or **plant** seed transformed with a DNA molecule encoding a hypersensitive response **elicitor polypeptide** or **protein** and growing the transgenic **plant** or transgenic **plant** produced from the transgenic **plant** seed under conditions effective to **enhance** the **longevity** of fruit or vegetable ripeness in a fruit or vegetable harvested from the transgenic **plant**.

ACTIVITY - Bactericidal.

The effect of treating orange fruits with Messenger (RTM) on post harvest orange storage was studied. On day 0, Fall-GLO orange fruits were treated by spraying Messenger (RTM) solution (15 micrograms/mL) or buffer solution (5mM KPO4, pH 6.8) on the surface of fruits in a 22 deg. C greenhouse. The Messenger (RTM) or buffer solutions on oranges were then dried by air, and the treated oranges were marked, mixed together, and put into a plastic container.

The container with treated oranges was then put into an 18 deg. C growth chamber for storage. On day 7, orange fruits were inoculated with Penicillium digitatum and Botrytis cinereaon by spraying a 105 cfu/ml suspension on the surface of orange fruit. The procedure was performed on 40 orange fruits per treatment. Measurements of disease were conducted on days 20, 24, and 26 following treatment with Messenger (RTM) or buffer solution.

The results showed that the Messenger (RTM) was more effective than buffer as a fruit spray treatment in reducing disease index for Penicillium digitatum and Botrytis cinereaon and providing longer storage life.

Messenger (RTM) treatment can reduce orange disease about 58.14% at 21 days, about 45.21% at 25 days, and 36.97% at 27 days after spraying treatment and 18 deg. C storage conditions. T-testing showed that there were statistically significant differences at both 95% and 99% confidence levels.

MECHANISM OF ACTION - Gene therapy.

USE - The methods are used for inhibiting post harvest disease (caused by Penicillium, Botrytis, **Phytophthora**, or **Erwinia**) or **desiccation** and **enhancing** the **longevity** in a fruits or vegetables (claimed).

ADVANTAGE - The methods enable growers, warehouse packers, shippers and suppliers to process, handle and store fruit and vegetables with reduced loses caused by post harvest disease and **desiccation**, therefore reducing costs to the consumer and improving quality.

Dwg.0/0

TECH UPTX: 20020123

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Methods: In methods (I) and (VII) the hypersensitive response **elicitor protein** or **polypeptide** is in isolated form. In (I), (II), (VII) and (VIII) the treatment is carried out prior to or after harvest of the fruit or vegetable by either spraying the fruit or vegetable with the hypersensitive response **elicitor protein** or **polypeptide** or out by immersing the fruit or vegetable in the hypersensitive response **elicitor protein** or **polypeptide**. The hypersensitive response **elicitor protein** or **polypeptide** is in liquid or powder form. The hypersensitive response **elicitor protein** or **polypeptide** is derived from a species of pathogen selected from **Erwinia** (E. amylovora, E. stewartii, E. chrysanthemi, E. carotovora), **Xanthomonas**, **Pseudomonas** (P. syringae, P. solanacearum), **Phytophthora** (especially), and

Clavibacter.
The treatment inhibits **desiccation** or a post harvest disease (caused by Penicillium, Botrytis, **Phytophthora**, or **Erwinia**) in a fruit or vegetable.
In the method (II) a transgenic **plant** or seed is produced. The transgenic **plant** is a dicot or a monocot. The method further comprises applying the hypersensitive response **elicitor polypeptide** or **protein** to the fruit or vegetable to inhibit post harvest disease or **desiccation**.
Preferred Cells: The host cell (V) is a **plant** cell or a bacteria cell (Agrobacterium).

=> d .wp l18 1-21

L18 ANSWER 1 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2002-179786 [23] WPIDS
DNC C2002-055895
TI New inducible promoter from the tobacco lipoxygenase gene, useful for preparing transgenic **plants** that express disease- or pest-resistance genes.
DC C06 D16 P13
IN BEFFA, R; ESQUERRE, T M T; FOURNIER, J; GROSJEAN, C M C; VERDAGUER, B; ESQUERRE-TUGAYE, M; GROSJEAN-COURNOYER, M
PA (RHOB-N) RHOBIO SA; (RHOB-N) RHOBIO
CYC 96
PI WO 2002006443 A2 20020124 (200223)* FR 41p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
FR 2811680 A1 20020118 (200223)
AU 2001072636 A 20020130 (200236)
ADT WO 2002006443 A2 WO 2001-FR2216 20010710; FR 2811680 A1 FR 2000-9250 20000713; AU 2001072636 A AU 2001-72636 20010710
FDT AU 2001072636 A Based on WO 200206443
PRAI FR 2000-9250 20000713
AB WO 200206443 A UPAB: 20020411
NOVELTY - Polynucleotide (I) containing a **plant** promoter regulatory region (A) comprising a 2330 bp sequence (1), reproduced.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(1) polynucleotide (Ia) that hybridizes selectively to (1) or has at least 80% homology with (1);
(2) expression cassette (EC) functional in **plants** and **plant** cells comprising a 5'-(I) or (Ia), coding sequence, and 3'-regulatory region;
(3) vector containing (I), (Ia) or EC;
(4) method for transforming **plant** cells by integrating into the genome at least one (I), (Ia), EC or the vector of (3);
(5) transformed **plant** cells produced by method (4);
(6) method for producing transgenic **plants** by regeneration from cells of (5), and optionally crossing with other **plants**; and
(7) **plants** produced by method (6) or their seeds.
USE - (I), where part of an expression cassette or vector, is used to produce transgenic **plants** (claimed), especially those that express (under control of (I)) a protein that imparts resistance to

diseases (bacterial, fungal or viral, especially **Phytophthora**) or insects.

ADVANTAGE - (I) is inducible by pathogens, at a very early stage, before development of necrosis or other symptoms.

Dwg.0/4

TECH UPTX: 20020411

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Materials: The promoter activity of (I) or (Ia) is induced in response to attack by a pathogen. (1) is the promoter of the tobacco (Nicotiana tabacum) lipoxygenase-1 gene (LOX1) and is functional in the cotyledon of the embryo; hypocotyl and cotyledon leaves during germination; in the 'neck' and petioles during growth and in the reproductive organs. It is induced by methyl jasmonate; 1-aminocyclopropane-1-carboxylic acid; heavy metals and lambda-carragheenan. In EC, the coding sequence encodes either a reporter or a **protein** that confers resistance to diseases or insects, particularly a fungal **elicitor** or lytic **peptide**, e.g. a chitinase, glucanase or oxalate oxidase, antimicrobial **peptide** or Bacillus thuringiensis insecticidal toxin.

Preferred **plants**: Transgenic **plants** are specifically tobacco, wheat, barley, sorghum, maize, rice, rape, cotton, sunflower, sugar beet and clover.

Preparation: A 1.4 kb cDNA fragment from the known pathogen-induced LOX gene of tobacco was used to screen a phage library of tobacco genomic DNA to identify the 2330 bp sequence (1), containing the 5'-end of the LOX gene and the upstream regulatory sequences. Analysis indicated presence of **elicitor** response elements upstream of the TATA box. Once isolated, the promoter can be inserted into standard vectors and these used for production of transgenic **plants** conventionally.

L18 ANSWER 2 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2002-130707 [17] WPIDS
DNC C2002-040123
TI Improving effectiveness of transgenic **plants** by topical application of a hypersensitive response **elicitor** **protein** to the transgenic **plant** or by incorporating into the **plant** a transgene encoding the **protein**.
DC C06 D16
IN DEROCHER, J E; WEI, Z; DEROCHER, J
PA (EDEN-N) EDEN BIOSCIENCE CORP; (DERO-I) DEROCHER J E; (WEIZ-I) WEI Z
CYC 94
PI WO 2001095724 A2 20011220 (200217)* EN 86p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001066879 A 20011224 (200227)
US 2002059658 A1 20020516 (200237)
ADT WO 2001095724 A2 WO 2001-US18955 20010613; AU 2001066879 A AU 2001-66879 20010613; US 2002059658 A1 Provisional US 2000-211585P 20000615, US 2001-880371 20010613
FDT AU 2001066879 A Based on WO 200195724
PRAI US 2000-211585P 20000615; US 2001-880371 20010613
AB WO 200195724 A UPAB: 20020313
NOVELTY - Improving (I) the effectiveness of transgenic **plants**, comprising applying a hypersensitive response **elicitor** (HRE) **protein** or **polypeptide** to the transgenic **plant** or incorporating into the transgene **plant** a transgene encoding a HRE **protein** or **polypeptide**, is new.

DETAILED DESCRIPTION - Improving (I) the effectiveness of transgenic **plants**, comprising:

(a) providing a **plant** or **plant** seed comprising a transgene conferring a transgenic trait to the **plant** or a **plant** grown from the **plant** seed, and applying to the **plant** or **plant** seed a HRE protein or polypeptide;

(b) providing a **plant** cell, transforming the **plant** cell with a first DNA molecule (D1) encoding a transcript or a protein or polypeptide which confers a trait to a **plant** growth from the transformed **plant** cell, and a second DNA molecule (D2) encoding a HRE protein or polypeptide which is different from the protein or polypeptide encoded by D1, under conditions effective to produce a transgenic **plant** cell, and regenerating a transgenic **plant** from the transformed **plant** cell.

INDEPENDENT CLAIMS are also included for the following:

(1) a transgenic **plant** (II) comprising D1 and D2;

(2) a transgenic **plant** seed obtained from (II);

(3) a DNA construct (III) comprising D1 and D2;

(4) a system (IV) for use in transforming **plants** with multiple DNA molecules, comprising (III);

(5) an expression system comprising first and second vectors into which (IV) is inserted;

(6) a transgenic host cell (V) comprising D1 and D2; and

(7) an expression system comprising a vector into which is inserted a heterologous (III).

USE - For improving the effectiveness of transgenic **plants** by maximizing the benefit of transgenic traits associated with a deleterious effect on growth, stress tolerance, disease or insect resistance, enhanced growth, herbicide resistance, male sterility, modified flower color, and biochemically modified **plant** product in the transgenic **plants** or overcoming the deleterious effects (claimed).

Dwg.0/0

TECH UPTX: 20020313

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: The HRE protein or polypeptide is applied under conditions effective to impart enhanced growth, stress tolerance, disease or insect resistance to the **plant** or the **plant** grown from the **plant** seed, which maximizes the benefit of the transgenic trait to the **plant** or the **plant** grown from the **plant** seed. The protein is applied on the **plant** or **plant** seed, by spraying, immersion, injection, dusting, coating or leaf abrasion at a time proximate to when the applying takes place. The protein is applied to the **plant** or **plant** seed as a composition further comprising a carrier such as water, aqueous solutions, slurries and powders. The composition contains greater than 0.5 nM of the HRE protein derived from a species of pathogens such as **Erwinia**, **Xanthomonas**, **Pseudomonas**, **Phytophthora** and **Clavibacter**. The **plant** cell is transformed with D1 and D2 by Agrobacterium. The **plant** cell is transformed with D1 to form a singly transformed **plant** cell and then transformed with D2 or vice versa. Transforming is performed under conditions effective to insert D1 and D2 into the genome of the transformed **plant** cell. Transforming comprises propelling particles at the **plant** cell under conditions effective for the particles to penetrate into the cell interior and introducing one or more expression vectors comprising D1, D2 or both into the **plant** cell interior. D1 encodes a protein or polypeptide chosen form Bacillus thuringiensis toxin, Photorahabdus luminscens protein, protease inhibitors, amylase inhibitors, lectins, chitinases, endochitinase, chitobiase, defensins, osmotins, crystal

proteins, virus proteins, herbicide resistance proteins, mannitol dehydrogenase, PG inhibitors, ACC degradation proteins, barnase, phytase, fructans, invertase and SAMase. D1 encodes a transcript chosen from antisense RNA which interferes with activity of an enzyme or synthesis of a product, and a sense RNA, and comprises a promoter operable in **plants**, a DNA coding sequence operably coupled 3' of the promoter, encoding the transcript or the protein or polypeptide which confers the trait, and a 3' regulatory region operably coupled to the DNA coding sequence. D2 comprises a promoter, DNA coding sequence encoding HRA protein or polypeptide and a 3' regulatory region.
Preferred **Plant**: In (II), D1 and D2 are stably inserted into the genome of the **plant** and is chosen from rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean, pea, chicory, lettuce, endive, cabbage, canola, cauliflower, broccoli, turnip, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, strawberry, cranberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum and sugarcane.
Preferred Construct: In (III), first and second promoters are different and the first promoter is inducible.
Preferred Cell: (V) is a bacterial (Agrobacterium) or **plant** cell.

L18 ANSWER 3 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2002-055588 [07] WPIDS
CR 2001-389883 [37]
DNC C2002-015949
TI Identifying **plant** disease resistance gene (R) or **elicitor** (E) with desired property by recombining R and E genes to form nucleic acid population encoding R **protein** or E from which desired R **protein** and E are detected.
DC C06 D16
IN ENGLISH, J; LASSNER, M; WU, G
PA (MAXY-N) MAXYGEN INC; (ENGL-I) ENGLISH J; (LASS-I) LASSNER M; (WUGG-I) WU G
CYC 95
PI WO 2001085909 A2 20011115 (200207)* EN 65p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2001059471 A 20011120 (200219)
US 2002035739 A1 20020321 (200224)
ADT WO 2001085909 A2 WO 2001-US14419 20010504; AU 2001059471 A AU 2001-59471 20010504; US 2002035739 A1 Provisional US 2000-202233P 20000505, US 2001-849452 20010504
FDT AU 2001059471 A Based on WO 200185909
PRAI US 2000-202233P 20000505; US 2001-849452 20010504
AB WO 200185909 A UPAB: 20020416
NOVELTY - Identifying **plant** disease resistance (R) gene with specified characteristic, or **elicitor** (E) of **plant** defense response with desired property, comprising recombining nucleic acids (NA) corresponding to R gene and genes encoding (E) (or enzyme catalyzing production of (E)) to form library of NA encoding R **proteins** or (E) and detecting R **protein** and (E) with desired properties, is new.
DETAILED DESCRIPTION - Identifying (M1) R gene with a specified characteristic, comprising:
(a) providing several R gene segments;

(b) recombining several R gene segments to produce a library of recombinant R gene segments;

(c) optionally repeating the recombination steps one or more times;

(d) expressing at least one recombinant R gene segment in at least one **plant** cell, and exposing the **plant** cell to (E) of a **plant** defense response; and

(e) detecting at least one **plant** defense response, and thereby identifying R gene with a specified characteristic.

Identifying (M2) (E) of a **plant** defense response with a desired property, comprising:

(a) providing several NA segments comprising at least one (E) or enzyme catalyzing production of (E) of a **plant** defense response;

(b) recombining several NA segments, thereby producing a library of recombinant NAs encoding (E)s or enzymes catalyzing production of (E)s;

(c) optionally repeating the recombination steps one or more times;

(d) exposing at least one **plant** cell to at least one (E) encoded by or produced by an enzyme encoded by a member of the library of the above mentioned recombinant NA; and

(e) detecting at least one **plant** defense response, identifying at least one (E) with a desired property.

INDEPENDENT CLAIMS are also included for the following:

(1) a transgenic **plant** (I) produced by integrating the at least one R gene with specified characteristic as identified by (M1), operably linked to a promoter functional in a **plant** cell into the genome of the **plant** cell and regenerating the **plant** cell;

(2) identifying (M3) a functional interaction between R gene and (E), comprising:

(a) introducing a first viral vector comprising R gene and a second viral vector comprising a gene encoding (E) or enzyme catalyzing production of (E) into at least one **plant** cell, such that R gene and (E) are cytoplasmically expressed in at least one **plant** cell; and

(b) detecting at least one **plant** defense response;

(3) identifying (M4) a functional interaction between R gene and (E), comprising:

(a) exposing at least one **plant** cell or a **plant** pathogen comprising an (E) of a **plant** defense response and R gene; and

(b) detecting at least one **plant** defense response;

(4) a bio-detector (II) comprising R gene encoding a product capable of activation by at least one (E) and a reporter operably linked to a promoter responsive to activated product of R gene;

(5) a **plant** or **plant** cell (III) comprising (II); and

(6) producing (M5) a gene with a desired property, comprising:

(a) introducing several RNA viral vectors comprising one or more gene of interest into at least one cell;

(b) growing the cell under conditions permitting cytoplasmic recombination between several RNA viral vectors, thereby producing a library of recombinant RNA viral vectors;

(c) optionally recovering at least one recombinant viral vector and repeating the above two steps; and

(d) identifying at least one RNA viral vector comprising a gene with a desired property.

USE - For identifying a **plant** disease resistance gene with a specified ligand binding, downstream signaling or kinase activation characteristic, and identifying an (E) of a **plant** defense response with a desired binding property or response elicitation. R gene with a specified characteristic as identified by (M1), is useful for

conferring resistance to at least one **plant** pathogen when introduced into a **plant** or **plant** cell. Introducing R gene with specified characteristic is carried out by inoculating the **plant** or **plant** cell with a non-integrating viral vector comprising R gene. Optionally, introduction of R gene is carried out by stably integrating R gene with specified characteristic operably linked to a promoter functional in a **plant**, into a **plant** cell, and regenerating the **plant** cell comprising R gene with specified characteristic into a transgenic **plant**. (E) with a desired property as identified by (M2) is useful for inducing a **plant** defense response on exposure to at least one **plant** cell. (All claimed). The novel R gene and associated signaling pathways are useful as bio-detectors or other environmental stressors. The evolved R genes can be stably integrated into **plant** genomes, and confer resistance to pathogens and other stresses upon **plants** growing in the field. The evolved R genes induce a reduced systemic acquired resistance (SAR) e.g. leads to decreased phenylpropanoid biosynthesis that leads to decreased levels of salicylic acid and confers improved resistance to insect pests. Also the R genes engineered into **plants** provide the **plant** with specific resistance to viral, bacterial, fungal and nematode parasites.

ADVANTAGE - The methods provide a means to identify and manipulate the components of plant disease response pathways to produce plants with enhanced disease resistance traits. The methods of diversifying DNA and RNA enable the production and selection with novel (E) specificities, multielicitor specificities and improved signaling capabilities, as well as the production of novel elicitors with desired properties. By using nucleic acid diversification and screening or selection procedures to evolve leucine-rich-repeat (LRR) domain of disease resistance genes, novel recognition specificities not found in nature, are engineered into receptors capable of interacting with a wide variety of ligands. Diversification of R gene also provides a means for developing robust resistance to pathogens for which innate specific resistance is weak or absent in a natural population.

Dwg.0/1

TECH UPTX: 20020130

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: (M1) and (M2) further involves repeating the recombination and screening process at least one additional time. In (M1), the R gene segments comprise at least one NA of a R gene of tomato, rice, Arabidopsis, barley, corn, soybean, flax, sugarbeet or wheat. The R gene segments comprise at least one NA of the homologs Bs2, Cf2, Cf4, Cf5, Cf9, Dm3, Fen, Hcr2, Hcr9, Hs1(pro-1), I2, L6, LRK10, M, Mlo, Mi, N, Pib, PRF, Pti1, Pto, Rp1-D, RPM1, RPP, RPS2, RPS4, Rx, Xa1 or Xa21. (M1) further involves mutating the R gene segments provided in the initial step of the method. Recombination is carried out in vivo, in vitro or in silico. The method preferably involves recombining RNA viruses comprising R gene segments or (E) or enzyme catalyzing production of (E) in vivo, preferably in **plant** cells. Expressing the recombinant R gene segment involves stably integrating at least one recombinant R gene operably linked to a promoter functional in a **plant** cell into the genome of at least one **plant** cell. Optionally, the recombinant R gene segment is expressed by inoculating the at least one **plant** cell with a non-integrating viral vector ((+) strand RNA viruses, (-) strand RNA viruses, ambisense viruses, single-stranded or double-stranded DNA viruses) comprising at least one recombinant R gene. Preferably, the non-integrating viral vector is a tobamovirus, potexvirus, potyvirus, a tobravirus, or a geminivirus. The expression of R gene is regulated by at least one viral or non-viral promoter active in the **plant** cell. Preferably, the promoter is a viral sub-genomic promoter. Alternatively, expressing at least one

recombinant R gene segment which further comprises a targeting signal (AvrBs2 or AvrPto target signal), involves infecting the at least one **plant** cell with a **plant** pathogen (e.g. a bacterial **plant** pathogen such as **Pseudomonas** sp.) comprising at least one recombinant R gene. The **plant** cell is exposed to (E) which is a product of Avr (avirulence) gene or Avr gene homolog. The method involves exposing the **plant** cell to an Avr gene product produced by a **plant** pathogen, where the Avr gene product produced by the **plant** pathogen is a heterologous Avr gene product. Optionally, the **plant** cell is exposed to an Avr gene product produced by a non-pathogenic microorganism or virus, e.g., a non-integrating viral vector. Alternatively, the **plant** cell is exposed to an Avr gene product produced by the **plant** cell which is a transgenic **plant** cell expressing an Avr gene. In (M1), the **plant** defense response which is detected is a hypersensitive (HR) response, a systemic acquired resistance (SAR) response, an induction of genes associated with a HR or a SAR, an accumulation of gene products or compounds associated with a HR or a SAR or a resistance to an infection by a **plant** pathogen. The method preferably involves detecting resistance to an infection by a **plant** pathogen by detecting a decrease in symptoms or a decrease in pathogen (bacterial, fungal, insect or nematode pathogen) growth. The **plant** defense response is detected by one or more of viability staining, visualization of local lesions, measuring calcium flux or monitoring electrolyte leakage. (M1) further involves recovering R gene with a specified characteristic by polymerase chain reaction (PCR), ligase chain reaction, Qbeta amplification, cloning, isolation of an RNA transcript or by reverse transcription of e.g. a viral RNA transcript. The recovery method further involves integrating the at least one R gene with a specified characteristic operably linked to a promoter functional in a **plant** cell into the genome of a **plant** cell, and regenerating a **plant** cell to produce a transgenic **plant** that expresses a product of R gene with specified characteristic. The transgenic **plant** is exposed to (E) which is the product of a recursively recombined Avr gene or Avr gene homolog, or a recursively recombined gene encoding an enzyme catalyzing the production of (E). By exposing the transgenic **plant** to (E), an (E) with desired property such as interacting with the product of the R gene with a specified characteristic, is identified by detecting at least one **plant** defense response. In (M2), the several NA segments used in the initial step comprises at least one of viral NA, bacterial NA, fungal NA, insect NA or nematode NA. The NA segments alternatively comprise an Avr gene or Avr gene homolog. The **plant** cell is exposed to an (E) by externally applying the at least one (E) to at least one **plant** cell, or by inoculating the **plant** cell with a non-integrating viral vector as described above which comprises a member of the library of recombinant NA encoding (E) or enzyme catalyzing production of (E). The expression of (E) or enzyme catalyzing production of (E) is regulated by at least one viral or non-viral promoter active in the **plant** cell. Preferably, the promoter is a viral subgenomic promoter. Optionally, the **plant** cell a cultured **plant** cell, a **plant** protoplast, a **plant** tissue, an isolated **plant** organ, an intact **plant** organ or a whole **plant** is exposed to an (E) by infecting the at least one **plant** cell with a **plant** pathogen e.g. **Pseudomonas** sp. comprising a member of the library or recombinant NA encoding (E) or enzyme catalyzing production of (E). Preferably, the **plant** cell expresses recursively recombined R gene with a specified characteristic and is a transgenic **plant** cell. The **plant** defense response (PDR) which is detected is HR, SAR response, induction of a gene

associated with HR or SAR response, accumulation of gene products or compounds associated with HR or SAR response, or a resistance to infection. (M2) further involves recovering NA encoding (E) or enzyme catalyzing production of (E) with a desired property by a method as described above. In (M3), the viral vectors employed are non-integrating viral vectors as described above, and where the expression of the R gene is regulated by a viral subgenomic promoter. At least one of R gene, or gene encoding (E) or enzyme catalyzing production of (E) is a member of a library of genes or gene segments, which library comprises one or more of a genomic library, an expression library, a transcript library, a DNA library, an RNA library, a PCR amplicon library, an expressed sequence tag (EST) library, a mutant library or a recursively recombined library. Optionally, at least one of the R gene or gene encoding (E) or enzyme catalyzing production of (E) comprise recursively recombined genes. The viral vectors are introduced into cultured **plant** cells, **plant** protoplast, **plant** tissue, isolated **plant** organ, intact **plant** organ or whole **plant**. PDR as described above, or a **plant** disease response, or resistance to infection by a **plant** pathogen, a decrease in symptoms of an infection or a reduction in pathogen growth is detected to identify a functional interaction between R gene and (E). In (M4), the **plant** cell is exposed to **Pseudomonas** sp.. The R gene involved in the method is a member of genomic library, an expression library, a DNA library, a PCR amplicon library, EST library, a mutant library or a recursively recombined library. The product of the R gene is translocated from the pathogen to the **plant** cell by a secretory system of the pathogen which comprises a type III secretory system, and the R gene segment further comprises a targeting signal as described above. In (M5), the RNA viral vectors are introduced by:

(a) inoculating the cell with infectious viral transcripts; or

(b) by introducing several cDNA molecules corresponding to viral transcripts.

The viral transcripts comprise the several cDNA molecules which are produced in the cytoplasm of the cell. The cDNA molecules are introduced by electroporoation, microinjection, biolistics, Agrobacterium-mediated transformation or agroinfection. The RNA viral vector comprises a **plant** viral vector, e.g. tobamovirus, potyvirus, tobravirus, potexvirus, or comprises tobacco mosaic virus (TMV), a TMV homolog, or an engineered viral vector derived from TMV or TMV homolog. The viral vectors comprise a protein coding sequence and are introduced into a isolated **plant** cell, a protoplast, a **plant** explant, a **plant** tissue, or an intact **plant**. The method involves growing the **plant** cell or intact **plant** comprising the **plant** cell, in a suspension culture. Cytoplasmic recombination is mediated by template switching of an RNA polymerase expressed by the cell. The RNA polymerase is a **plant** viral RNA polymerase, or a mutant or engineered viral RNA polymerase that enhances the frequency of homologous or non-homologous RNA recombination relative to a wild-type **plant** viral RNA polymerase. The mutant R gene engineered viral RNA polymerase is by a directed evolution process e.g., a DNA or RNA recombination procedure. The method further involves recovering recombinant viral vector by isolating RNA from the cell, and identifying the RNA viral vector comprising a gene with desired property by selection or screening. The method preferably involves introducing a first and second RNA viral vectors incapable of systemic infection in a **plant**, which first and second viral vectors have complementary mutations in genes essential for systemic infection, and identifying a recombinant RNA viral vector by selecting or screening for RNA viral vectors capable of systemic infection. The selection or screening is performed by sampling a **plant** cell or tissue remote from the

site of introduction. The first and second viral vectors have complementary mutations in one or more of a gene encoding a viral movement protein or viral coat protein.
Preferred Bio-detector: (II) comprises R gene which is recursively recombined and has a specified characteristic. The R gene encodes a product capable of activation by a designated (E) such as Avr gene product. The reporter is green fluorescent protein, a carotenoid biosynthetic enzyme, an anthocyanin regulatory gene or a luciferase. The reporter is operably linked to a promoter derived from a gene in SAR pathway or to a promoter comprising a pathogenesis-related (PR) gene promoter.
Preferred **Plant** Cell: One or more components of (II) is stably integrated into a chromosome of (III), or are extrachromosomally replicated. The extrachromosomally replicated component of (II) comprises a non-integrating viral vector.

L18 ANSWER 4 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2001-590177 [66] WPIDS
DNN N2001-439566 DNC C2001-175137
TI New **plant** pathogen hypersensitive response **elicitor** -receptor **protein** isolated from **plants**, which upon silencing is used to study **plant** signal transduction pathways leading to disease resistance and growth enhancement.
DC C06 D16 P13 S03
IN FAN, H; SONG, X; WEI, Z
PA (EDEN-N) EDEN BIOSCIENCE CORP; (FANH-I) FAN H; (SONG-I) SONG X; (WEIZ-I) WEI Z
CYC 94
PI WO 2001070988 A2 20010927 (200166)* EN 78p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001047562 A 20011003 (200210)
US 2002007501 A1 20020117 (200212)
ADT WO 2001070988 A2 WO 2001-US8728 20010319; AU 2001047562 A AU 2001-47562 20010319; US 2002007501 A1 Provisional US 2000-191649P 20000323, Provisional US 2000-250710P 20001201, US 2001-810997 20010316
FDT AU 2001047562 A Based on WO 200170988
PRAI US 2000-250710P 20001201; US 2000-191649P 20000323; US 2001-810997 20010316
AB WO 200170988 A UPAB: 20011113
NOVELTY - An isolated **protein** (I) which serves as a receptor in **plants** for **plant** pathogen hypersensitive response **elicitors** (HRE), is new.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(1) an isolated nucleic acid molecule (II) encoding (I);
(2) an antisense nucleic acid molecule (III) to (II);
(3) an expression vector (IV) comprising (II) which is heterologous to the expression vector;
(4) an expression vector containing (III) which is heterologous to the expression vector;
(5) a transgenic host cell (V) transformed with (II);
(6) a host cell transformed with (III);
(7) a transgenic **plant** (VI) transformed with (II);
(8) a transgenic **plant** transformed with (III);
(9) a transgenic **plant** seed (VII) transformed with (II);

(10) a transgenic **plant** seed transformed with (III);

(11) enhancing (M1) **plant** receptivity to treatment with HRE which involves providing (VI) or (VII);

(12) imparting (M2) disease resistance, enhancing growth, controlling insects and/or imparting stress resistance to **plants** involves providing transgenic **plant** or **plant** seed transformed with a DNA construct effective to silence expression of (II); and

(13) imparting (M3) disease resistance, enhancing growth controlling insects and/or imparting stress resistance to **plants** involves providing transgenic **plant** or **plant** seed transformed with (II).

ACTIVITY - Virucide; fungicide; antibacterial. HrBP1 was over-expressed in tobacco **plants** under the control of an NOS promoter. When infiltrated with purified harpin, the transgenic lines developed HR much faster than wild type **plants**. The HrBP1 over-expressing lines were about 20-30% taller than wild-type Xanthi NN **plants**. 61-day-old wild type and hypersensitive response **elicitor** binding **protein** 1 (HrBP1) over-expressing Xanthi NN tobacco **plants** were inoculated with tobacco mosaic virus (TMV) by rubbing TMV with diatomaceous earth on the upper surface of leaves. Lesions appeared 2 days after manual inoculation. The diameter of disease spots was measured. On average, the diameter of lesions on transgenic **plant** leaves were 33.4% less than that on wild type **plants**. Therefore, the surface area of lesions on transgenic **plant** leaves was about 44.3% of those of the wild type **plants**.

MECHANISM OF ACTION - Positive regulator of the **plant** signal transduction pathway for growth and disease resistance.

USE - (I) is useful for identifying agents targeting **plant** cells which involves forming a reaction mixture comprising (I) and a candidate agent, evaluating the reaction mixture for binding between the **protein** and the candidate agent and identifying candidate agents which bind to the **protein** in the reaction mixture as **plant** cell targeting agents. (V) is useful for identifying agents targeting **plant** cells which involves forming a reaction mixture comprising (V) and a candidate agent, evaluating the reaction mixture for binding between the **protein** produced by the host cell and a candidate agent and identifying candidate agents which bind to the **protein** produced by the host cell in the reaction mixture as **plant** cell targeting agents. By (M1) and (M3), disease resistance, enhanced **plant** growth, control of insects and stress tolerance are imparted to the **plants**. HRE treatment to the **plants** in (M1) enhances **plant** growth, imparts disease resistance, controls insects and imparts stress tolerance (all claimed). (I) can be used as a novel way to screen for new inducers of **plant** resistance against insect, disease and stress and of growth enhancement. The **protein** is useful for understanding the harpin (**Erwinia** amylovora hypersensitive response **elicitor**) induced signal transduction pathway in **plants**. (M2) is useful for studying the downstream components of signal transduction pathway in **plants** which eventually leads to disease resistance, growth enhancement, insect control and stress resistance. By (M1) and (M3), the **plants** are made resistant to infection by viruses, bacteria and fungi, and are imparted with resistance against environmental stress and insects.

ADVANTAGE - Imparting disease resistance to **plants** through HRE treatment has the potential to treat previously untreatable diseases, treating diseases systemically which might not be treated separately due to cost, and avoids the use of infectious agents or environmentally harmful materials. By HRE treatment enhanced **plant** growth is

achieved which includes greater yield, increased quantity of seeds produced, increased percentage of seeds germinated, increased **plant** size, greater biomass, more and bigger fruits, etc., which results in economic benefit to cultivators. Greater yield, increased size and enhanced biomass allow greater revenue generation from the given plot of **plant**.
Dwg.0/12

TECH UPTX: 20011113
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Protein: (I) serves as a receptor for HRE from **plant** pathogens such as **Erwinia**, **Pseudomonas**, Xanthamonas, **Phytophthora** or **Clavibacter**. Preferably, (I) is a receptor for HRE from E. amylovora. (I) is preferably from a monocot such as rice or from a dicot such as Arabidopsis thaliana.
Preferred Nucleic Acid: (II):
(a) hybridizes to a fully defined sequence of 613 nucleotides (S5) under stringent conditions;
(b) has a nucleotide sequence of (S5);
(c) hybridizes to the fully defined sequence of 1000 nucleotides (S2) or 205 nucleotides (S9) as given in specification;
(d) has a nucleotide sequence of (S2);
(e) hybridizes to a fully defined sequence of 4260 nucleotides (S3) as given in the specification under stringent conditions; or
(f) has a sequence of (S3).
Preferred Expression Vector: In (IV), (II) is positioned in sense orientation and correct reading frame.
Preferred Host Cell: (V) is a **plant** or bacterial cell, where the DNA molecule is transformed with an expression system.
Preferred Transgenic **Plant**: (VI) or (VII) is a alfalfa, rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, cauliflower, broccoli, turnip, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum, and sugarcane. Preferably, (VI) is A. thaliana, Saintpaulia, petunia, pelargonium, poinsettia, chrysanthemum, carnation, or zinnia.
Preferred Method: In (M1) and (M2), preferably, (VI) is provided, and if (VII) is provided the method further involves planting the **plant** seeds under conditions such that the **plants** grow from the planted seeds. The method further involves providing HRE treatment for imparting disease resistance, enhancing **plant** growth, controlling insects, or for imparting stress tolerance to the **plants**. Preferably, (VI) or (VII) is further transformed with a second nucleic acid encoding HRE, where expression of the second nucleic acid affects the HRE treatment. In (M2), the DNA construct is (III), or is transcribable to a first nucleic acid encoding a receptor in **plants** for **plant** pathogen HRE coupled to second nucleic acid encoding inverted complement of first nucleic acid. In (M3), preferably, (VI) is provided, and if (VII) is provided the method further involves planting the **plant** seeds under conditions such that the **plants** grow from the planted seeds.

L18 ANSWER 5 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2001-488791 [53] WPIDS
DNN N2001-361641 DNC C2001-146752
TI New chimeric gene, useful for controlling **plant**-pathogenic fungi and producing oomycete-resistant transgenic **plants**, comprises first DNA encoding hypersensitive response elicitor, promoter and regulatory region.

DC C06 D16 P13
IN BAUER, D W; BEER, S V
PA (CORR) CORNELL RES FOUND INC; (BAUE-I) BAUER D W; (BEER-I) BEER S V
CYC 94
PI WO 2001055347 A1 20010802 (200153)* EN 73p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2001033007 A 20010807 (200174)
US 2002069434 A1 20020606 (200241)
ADT WO 2001055347 A1 WO 2001-US2579 20010126; AU 2001033007 A AU 2001-33007 20010126; US 2002069434 A1 Provisional US 2000-178565P 20000126, US 2001-770693 20010126
FDT AU 2001033007 A Based on WO 200155347
PRAI US 2000-178565P 20000126; US 2001-770693 20010126
AB WO 200155347 A UPAB: 20010919
NOVELTY - A chimeric gene comprising:

(a) a first DNA molecule encoding a hypersensitive response **elicitor protein** or **polypeptide**;

(b) a promoter operably linked 5' to the first DNA molecule to induce transcription of the first DNA molecule in response to activation of the promoter by an oomycete; and

(c) a 3' regulatory region operably linked to the first DNA molecule, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) an expression system comprising a vector into which the chimeric gene is inserted;

(2) a host cell comprising the chimeric gene;

(3) a transgenic **plant** resistant to disease resulting from oomycete infection comprising the chimeric gene, where the promoter induces transcription of the first DNA molecule in response to infection of the **plant** by an oomycete;

(4) making a recombinant **plant** cell comprising transforming a **plant** cell with the chimeric gene to yield transcription of the first DNA molecule in response to oomycete-induced activation of the promoter;

(5) making a **plant** resistant to disease resulting from oomycete infection comprising:

(a) transforming a **plant** cell with the chimeric gene to yield transcription of the first DNA molecule in response to oomycete-induced activation of the promoter; and

(b) regenerating a **plant** from the transformed **plant** cell;

(6) a transgenic **plant** seed obtained from the transgenic **plant**; and

(7) a transgenic **plant** scion or rootstock cultivator obtained from the transgenic **plant**.

ACTIVITY - Antifungal.

The antifungal properties of the gst1:hrpN construct was evaluated. The Arabidopsis lines GSSN 8-4 (test **plants** containing the gst1:hrpN construct), Col-0 WT (wild type, control) and Col-0 EV (empty vector, control) were inoculated by drop inoculation with a conidiophore suspension (5 X 10 to the power of 4 spores/ml) of **Phytophthora** parasitica. **Plants** were maintained in a growth chamber (16 hours of light, 18 deg. C, 100% humidity) and were scored for infection 10 days post inoculation. A rating of 1, 0 conidiophores present, 2, 0-5

conidiophores present, 3, 6-20 conidiophores present on a few leaves, 4, 6-20 conidiophores on all leaves, 5, 20 or more conidiophores on all leaves. Nearly all (29 out of 30) GSSN **plants** were free of any signs of **Phytophthora** parasitica and had a disease rating of 1. Trypan blue staining showed that growth of the oomycete was strongly inhibited in GSSN **plants**. Extensive hyphal growth was evident in Col-0 WR and Col-0 EV **plants** with disease ratings of 5 or 4.

MECHANISM OF ACTION - Gene therapy.

USE - The chimeric gene is useful as an effective and safe means of controlling **plant**-pathogenic fungi, particularly oomycetes, which are responsible for major crop loss. The chimeric gene is also useful for producing transgenic **plants** that are resistant to disease resulting from oomycete infection.

Dwg.0/5

TECH UPTX: 20010919

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Chimeric Gene: The chimeric gene further comprises a second DNA molecule encoding a secretion signal **polypeptide**, where the second DNA molecule is operably linked between the promoter and the first DNA molecule. The second DNA molecule encodes a secretion signal **polypeptide** comprising a sequence having 34, 34, 30 or 25 amino acids (from Nicotiana tabacum) fully defined in the specification. The second DNA molecule comprises a nucleotide sequence of nt 8-110 from a DNA sequence having 110, 102, 90 or 75 base pairs (bp) fully defined in the specification. The promoter is a gst1 promoter, which comprises a nucleotide sequence having 696 bp (obtained from Solanum tuberosum) fully defined in the specification or its fragments. The hypersensitive response **elicitor protein** or **polypeptide** is derived from a species of pathogen selected from **Erwinia**, **Xanthomonas**, **Pseudomonas**, **Phytophthora** or **Clavibacter**. The hypersensitive response **elicitor protein** or **polypeptide** may be derived from **Erwinia** amylovora, which comprises a sequence having 403 amino acids fully defined in the specification, and where the first DNA molecule comprises a nucleotide sequence having 1288 bp fully defined in the specification. The hypersensitive response **elicitor protein** or **polypeptide** may also be derived from E. carotovora, E. stewartii or E. chrysanthemi. The hypersensitive response **elicitor protein** or **polypeptide** derived from E. chrysanthemi comprises a sequence having 338 amino acids fully defined in the specification, and the first DNA molecule comprises a nucleotide sequence having 2141 bp also fully defined in the specification. The hypersensitive response **elicitor protein** or **polypeptide** is also derived from **Pseudomonas** syringae, where the hypersensitive response **elicitor protein** or **polypeptide** has a sequence comprising 341 amino acids fully defined in the specification, and the first DNA molecule comprises a nucleotide sequence having 1026 bp fully defined in the specification. The hypersensitive response **elicitor protein** or **polypeptide** may also be derived from P. solanacearum and comprises a sequence having 344 amino acids fully defined in the specification, where the first DNA molecule has a nucleotide sequence comprising 1035 bp also fully defined in the specification. The chimeric gene is stably inserted into the genome of the transgenic **plant**.

Preferred Cell: The host cell is a bacterial cell or **plant** cell. In particular, the bacterial cell is an Agrobacterium cell. The oomycete is a species of Plasmopara, **Phytophthora**, Peronospora, Pseudoperonospora, Bremia, Sclerospora, Aphanomyces, Pythium or Albugo. Preferably the oomycete is Plasmopara viticola or **Phytophthora** parasitica. The oomycete may also be Peronospora tabacina, Pythium spp. or **Phytophthora** spp.

Preferred **Plant**: The transgenic **plant** is selected from rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean, pea, chicory, lettuce, endive, cabbage, cauliflower, broccoli, turnip, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum and sugarcane. Preferably, the transgenic **plant** is a grape **plant**. The transgenic **plant** may also be a tobacco **plant**.

Preferred Method: In the method (5), transforming is performed under conditions effective to insert the chimeric gene into the genome of the **plant** cell. Preferably, the transforming step is Agrobacterium mediated, and comprises:

(a) propelling particles at the **plant** cell for the particles to penetrate into the cell interior; and

(b) introducing the expression vector comprising the chimeric gene into the **plant** cell interior.

L18 ANSWER 6 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2001-308571 [32] WPIDS
DNC C2001-095348
TI Stimulating natural defenses of **plants**, especially against fungal or bacterial infections, by application of **plant** extract containing enzymes and/or other peptides.
DC C03 D16
IN BONINI, N
PA (GITE-N) GITEN GRP SA
CYC 23
PI WO 2001030161 A1 20010503 (200132)* FR 18p
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU BR NZ US ZA
AU 9963466 A 20010508 (200149)
ADT WO 2001030161 A1 WO 1999-FR2610 19991025; AU 9963466 A AU 1999-63466 19991025, WO 1999-FR2610 19991025
FDT AU 9963466 A Based on WO 200130161
PRAI WO 1999-FR2610 19991025
AB WO 200130161 A UPAB: 20010611

NOVELTY - Stimulating the natural defenses of **plants**, by production of phytoallexins and peroxidases under the action of **elicitors**, involves applying (to the foliage or leaves or by injection) a mixture of **plant** extracts containing at least one **protein** (I) selected from proteases, lipases, pectinases, beta -1,3-glucanases, xylanases, galactanases, mannanases, chitinases and non-enzyme **peptides**.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for the use of (I) for stimulating the natural defences of **plants**, where (I) is formulated with conventional agricultural supports or carriers of the wetting/penetrating type,

ACTIVITY - Fungicidal; bactericidal.

MECHANISM OF ACTION - Natural defense mechanism stimulant, phytoallexin and peroxidase production stimulant.

A solution of a protease obtained from the sap or skin of Euphorbiaceae fruit was applied to the leaves of 15 day old melon **plants**. The peroxidase activity was increased 6-fold compared with that in control **plants** treated with water.

USE - (I) is specifically applied to vines, to prevent attack by oidium, mildew, Botrytis, wood diseases or soil disease; fruit trees, especially pear or apple trees, to prevent attack by oidium, spot, Monilia or bacterial diseases; cereals, especially wheat, maize or rice, to prevent attack by oidium, Septoria, rusts, Fusarium, Pyricularia or

bacterial diseases; oleaginous **plants**, especially soya, sunflower or rape, to prevent attack by oidium, Phoma or bacterial diseases; leguminous **plants**, especially tomatoes, melons, carrots, cauliflower or potatoes, to prevent attack by **Phytophthora**, Pythium, Rhizoctonia, Sclerotinia, Pyrenochaeta, Fusarium, Verticillium and bacterial diseases; or turf or horticultural **plants**, to prevent attack by **Phytophthora**, Pythium, Rhizoctonia, Sclerotinia, Pyrenochaeta, Fusarium, oidium and bacterial diseases (all claimed).

ADVANTAGE - (I) stimulates the natural defense mechanism of **plants** and increases the effectiveness of **plant** protectants already present.

Dwg.0/0

TECH UPTX: 20010611

TECHNOLOGY FOCUS - AGRICULTURE - Preferred Components: The non-enzymatic peptide contains at least 2 amino acid residues. The composition contains at least one hydrolase enzyme or at least one non-enzyme peptide.

L18 ANSWER 7 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2001-308570 [32] WPIDS
DNC C2001-095347
TI Stimulating natural defenses of **plants**, especially against fungal or bacterial infections, by application of fungal or bacterial enzymes and/or other peptides.
DC C03 D16
IN BACOU, J C; BESNARD, O; MARTINEZ, C
PA (MYCO-N) MYCOS SARL
CYC 36
PI WO 2001030160 A1 20010503 (200132)* FR 19p
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU BR CA CN HU IL IN JP MA MX NZ PL RO RU TR US YU ZA
FR 2799935 A1 20010427 (200132)
AU 2001010347 A 20010508 (200149)
ADT WO 2001030160 A1 WO 2000-FR2970 20001025; FR 2799935 A1 FR 1999-13483 19991025; AU 2001010347 A AU 2001-10347 20001025
FDT AU 2001010347 A Based on WO 200130160
PRAI FR 1999-13483 19991025
AB WO 200130160 A UPAB: 20010611

NOVELTY - Stimulating the natural defenses of **plants**, by production of phytoallexins and peroxidases under the action of **elicitors**, involves applying (to the foliage or leaves or by injection) at least one **protein** (I) selected from proteases, lipases, pectinases, beta -1,3-glucanases, xylanases, galactanases, mannanases, chitinases and non-enzyme **peptides**, produced by fungal or bacterial microorganisms.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for the use of (I) for stimulating the natural defenses of **plants**, where (I) is formulated with conventional agricultural supports or carriers of the wetting/penetrating type,

ACTIVITY - Fungicidal; bactericidal.

MECHANISM OF ACTION - Natural defense mechanism stimulant; phytoallexin and peroxidase production stimulant.

A solution of a cellulase obtained from the fungal strain Trichoderma harzianum A1 (5 U/ml) was applied to the leaves of 15 day old melon **plants**. The peroxidase activity was increased 5-fold compared with that in control **plants** treated with water.

USE - (I) is specifically applied to vines, to prevent attack by oidium, mildew, Botrytis, wood diseases or soil disease; fruit trees, especially pear or apple trees, to prevent attack by oidium, spot, Monilia or bacterial diseases; cereals, especially wheat, maize or rice, to

prevent attack by oidium, Septoria, rusts, Fusarium, Pyricularia or bacterial diseases; oleaginous **plants**, especially soya, sunflower or rape, to prevent attack by oidium, Phoma or bacterial diseases; leguminous **plants**, especially tomatoes, melons, carrots, cauliflower or potatoes, to prevent attack by **Phytophthora**, Pythium, Rhizoctonia, Sclerotinia, Pyrenochaeta, Fusarium, Verticillium and bacterial diseases; or turf or horticultural **plants**, to prevent attack by **Phytophthora**, Pythium, Rhizoctonia, Sclerotinia, Pyrenochaet a, Fusarium, oidium and bacterial diseases (all claimed).

ADVANTAGE - As well as stimulating the natural defense mechanism of **plants**, (I) increases the effectiveness of **plant** protectants already present.

Dwg.0/0

TECH UPTX: 20010611

TECHNOLOGY FOCUS - AGRICULTURE - Preferred Components: The non-enzymatic peptide contains at least 2 amino acid residues. The composition contains at least one hydrolase enzyme or at least one non-enzyme peptide.

L18 ANSWER 8 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2001-007224 [01] WPIDS
DNN N2001-005166 DNC C2001-001839
TI DNA molecules that encode **proteins** that bind to general **elicitors**, to inhibit growth when applied to **plants** or **plant** cells.
DC C06 D16 P13
IN BOLLER, T; FELIX, G; GOMEZ, L
PA (SYNG-N) SYNGENTA PARTICIPATIONS AG; (NOVS) NOVARTIS AG; (NOVS) NOVARTIS-ERFINDUNGEN VERW GES MBH
CYC 92
PI WO 2000066740 A1 20001109 (200101)* EN 54p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000050636 A 20001117 (200111)
ADT WO 2000066740 A1 WO 2000-EP3924 20000502; AU 2000050636 A AU 2000-50636 20000502
FDT AU 2000050636 A Based on WO 200066740
PRAI GB 1999-10965 19990504
AB WO 200066740 A UPAB: 20001230
NOVELTY - A DNA molecule (I) encoding a **protein** capable of binding to a general **elicitor** (III), is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a DNA (Ia) encoding a protein having at least 40% identity to a fully defined sequence of 1173 amino acids;

(2) a protein (II) encoded by (I) or (Ia);

(3) a DNA sequence (Ib) encoding a protein of structure (X)n-R-(X)m, where X is any amino acid, n and m independently designate any number between 0 and 1000, and R defines a protein component of 15 amino acids having 60% or more identity with sequence RINSAKDDAAGLQIA;

(4) a protein (IIa) encoded by (Ib);

(5) an expression cassette (IV) comprising (I), (Ia) or (Ib), operably linked to a promoter for expression in host organisms such as a microorganism or **plant**, and optionally to a transcriptional terminator;

(6) a host organism (V) with (I), (Ia), (Ib) or (IV) stably

integrated into its genome;
(7) a **plant** or progeny comprising (I), (Ia), (Ib) or (IV) stably integrated into its genome;
(8) a growth inhibitory composition comprising (IIa); and
(9) protecting **plants** against pests by expressing (I), (Ia) and/or (Ib) in the **plant**.
ACTIVITY - None given.
MECHANISM OF ACTION - **Plant** growth inhibitor; **plant** defense response inducer.
Arabidopsis thaliana seeds of ecotypes Ao-0, Col-0, La-er, Nd-0 and Ws-0 were vernalized prior to germination. For growth in soil, seeds were germinated and grown in growth chambers. Seedlings grown for 5 days on MS (Murashige Skoog) agar plates were transferred to liquid MS medium supplied with different proteins. The effect of treatment with different proteins on seedling growth was analyzed after 7 to 14 days by weighing (fresh weight). Addition of the flagellin-derived protein flg22 to the liquid medium of young A. thaliana seedlings caused a strong reduction in growth. Treatment with flg22 affected growth of roots, leaves and cotyledons. Consequently, the treatment also resulted in strong reduction in fresh weight increase. The inhibitory effect was dose-dependent, and a concentration of 100 nM flg22 caused half-maximal growth reduction. Prolonged incubation of the seedlings in the presence of flg22 resulted in dwarf **plants** but the seedlings remained green and did not show necrosis.
USE - (I), (Ia), (Ib), (II), (IIa) and compositions comprising (IIa), are useful for inhibiting growth of **plants** such as maize, sugar beet, cotton, rice, wheat, barley, sorghum, tomato, melon, pepper and Brassica, or **plant** cells by direct or indirect application. (I), (Ia) or (Ib) is useful for protecting **plant** against pests.
ADVANTAGE - (IIa) causes at least 75% growth inhibition when applied in 10 micro M concentration for 7 days to 5 day old seedlings of Arabidopsis thaliana ecotype Col-0.
Dwg.0/0

TECH UPTX: 20001230
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Sequence: (III) comprises a domain having 60% or more, preferably 93% amino acid sequence identity with the amino terminal sequence of flagellin protein from **Pseudomonas** aeruginosa comprising sequence RINSAKDDAAGLQIA. The nucleotide composition is optimized for expression in monocots. The 15 amino acid protein component of (Ib) has S in position 4, D in position 7 and/or 8, and G in position 11. The protein further comprises a basic amino acid in position 1, a non-polar amino acid in position 2, 9, 12, 13 or 14, an uncharged or non-polar amino acid in position 3, 5, 10 or 15, an uncharged polar, non-polar or basic amino acid in position 4 or 6, and an acidic amino acid in position 8. The protein has R or K in position 1, I in position 2, N, A or L in position 3, S, R, K or A in position 4, A or S in position 5, K, A, G, S or L in position 6, D in position 7 and 8, A in position 9, A or S in position 10, G in position 11, L, Q or N in position 12, Q, A, G, F or T in position 13, I or V in position 14 and A, S or V in position 15. The protein component is preceded by sequence NH2-N1-Leu-N2-N3-Gly-N4-COOH, where N1 is R or K, N2 is S or A, N3=T or S, and N4=S, L, K or Y.

L18 ANSWER 9 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-620215 [60] WPIDS
DNC C2000-185943
TI Deoxyribonucleic acid fragment for identifying homologues capable of promoting pathogen-induced transcription is obtained from a **plant** specie.
DC B04 C06 D13 D16 D17 F09

IN CUSTERS, J H H V; MELCHERS, L S; CUSTERS, J
PA (ZENE) ZENECA MOGEN BV; (MOGE-N) MOGEN INT NV; (SYGN) SYNGENTA MOGEN BV
CYC 93
PI EP 1041148 A1 20001004 (200060)* EN 29p
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
WO 2000060086 A1 20001012 (200060) EN
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000043964 A 20001023 (200107)
EP 1165794 A1 20020102 (200209) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ADT EP 1041148 A1 EP 1999-201065 19990402; WO 2000060086 A1 WO 2000-EP2619 20000324; AU 2000043964 A AU 2000-43964 20000324; EP 1165794 A1 EP 2000-925136 20000324, WO 2000-EP2619 20000324
FDT AU 2000043964 A Based on WO 200060086; EP 1165794 A1 Based on WO 200060086
PRAI EP 1999-201065 19990402
AB EP 1041148 A UPAB: 20001123
NOVELTY - A deoxyribonucleic acid (DNA) fragment from Arabidopsis thaliana is capable of promoting pathogen-inducible transcription of an associated DNA sequence when re-introduced into a **plant**. The DNA fragment has nucleotides 1-1728 of a 1782 nucleotide sequence, fully defined in the specification.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a chimeric DNA sequence comprising in the direction of transcription the novel DNA fragment and a DNA sequence expressed under the transcriptional control which is not naturally under the control of the DNA fragment;

(2) a replicon comprising the chimeric DNA sequence of (1);

(3) a microorganism containing the replicon of (2);

(4) a **plant** cell comprising the chimeric DNA sequence of (1) incorporated into its genome; and

(5) a portion or variant of the novel DNA fragment.

USE - For identifying homologs capable of promoting pathogen-induced transcription in a **plant** (claimed). The variant of the DNA fragment can be used to make a hybrid regulatory DNA sequence (claimed). The chimeric DNA is used to produce transformed pathogen resistant **plants** (claimed).

ADVANTAGE - The invention enhances resistance level and the production of antipathogenic substances. The **plant** with improved resistance against pathogens may be grown in the field, in the green house, or at home. **Plants** or its edible parts may be used for animal feed or human consumption, or may be processed for food, feed or other purposes in any form of agriculture or industry. It also has decreased need for biocide treatment, lowering costs of material, labor, and environmental pollution.

Dwg.0/6

TECH UPTX: 20001123
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Component: The DNA sequence causes production of antipathogenic **protein**. The **protein** is chitinases, glucanases, osmotins, magainins, lectins, saccharide oxidase, oxalate oxidase, oxalate decarboxylase, toxins from Bacillus thuringiensis, antifungal **proteins** isolated from Mirabilis jalapa, Amaranthus, Raphanus, Brassica, Sinapis, Arabidopsis, Dahlia,

Cnicus, Lathyrus, Clitoria, Allium seeds, Aralia and Impatiens, or albumin-type **proteins**, e.g. thionine, napin, barley trypsin inhibitor, cereal gliadin, or wheat-alpha-amylase. It can induce a hypersensitive response, e.g. Cf, Bs3, and Pto **proteins** from tomato, Rpm1 and Rps2 from Arabidopsis thaliana, N-**protein** from tobacco, avr **proteins** from Cladosporium fulvum, harpins from **Erwinia** and **elicitor proteins** (avrBs3, avrRpm1, avrRpt2) from **Pseudomonas** or **Xanthomonas**. Preferred **Plant**: The **plant** is decotyledonous and consists of cells. It belongs to the Cruciferae family. A part of it is from seeds, flowers, tubers, roots, leaves, fruits, pollen, or wood.

L18 ANSWER 10 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-376566 [32] WPIDS
DNC C2000-113968
TI Application of a hypersensitive response **elicitor** **protein** to **plants** to impart stress resistance.
DC C06 D16
IN SCHADING, R L; WEI, Z
PA (EDEN-N) EDEN BIOSCIENCE CORP
CYC 87
PI WO 2000028055 A2 20000518 (200032)* EN 84p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW
AU 2000016067 A 20000529 (200041)
EP 1124974 A2 20010822 (200149) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
KR 2001083949 A 20010903 (200217)
ZA 2001003362 A 20020227 (200223) 99p
HU 2001004375 A2 20020328 (200234)
JP 2002529095 W 20020910 (200274) 97p
ADT WO 2000028055 A2 WO 1999-US26039 19991104; AU 2000016067 A AU 2000-16067 19991104; EP 1124974 A2 EP 1999-958773 19991104, WO 1999-US26039 19991104; KR 2001083949 A KR 2001-705585 20010503; ZA 2001003362 A ZA 2001-3362 20010425; HU 2001004375 A2 WO 1999-US26039 19991104, HU 2001-4375 19991104; JP 2002529095 W WO 1999-US26039 19991104, JP 2000-581221 19991104
FDT AU 2000016067 A Based on WO 200028055; EP 1124974 A2 Based on WO 200028055; HU 2001004375 A2 Based on WO 200028055; JP 2002529095 W Based on WO 200028055
PRAI US 1998-107243P 19981105
AB WO 200028055 A UPAB: 20000706
NOVELTY - Imparting stress resistance to **plants** comprises applying a hypersensitive response **elicitor** (HRE) **protein** or **polypeptide** in a non-infectious form to a **plant** or seed.

DETAILED DESCRIPTION - A INDEPENDENT CLAIM is also included for providing a transgenic **plant** or seed comprising a DNA molecule encoding for a HRE protein or polypeptide and growing the **plant** or **plants** under conditions effective to impart stress resistance.

USE - The method can be used to impart stress resistance to **plants**.

Dwg.0/0
TECH UPTX: 20000706

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Methods: The stress resistance may be imparted by providing a transgenic **plant** or seed transformed with a DNA molecule which encodes the HRE. The HRE **protein** is derived from **Erwinia**, especially E. amylovora, E. carotovora, E. chrysanthemi and E. stewartii, **Pseudomonas**, especially P. syringae or P. solancearum, Xanthamonas, Phythophthera or **Clavibacter**, especially C. michiganesis sepedonicus. Preferably the **plants** are treated during the applying. In particular the (transgenic) seeds are treated during the applying and the method further comprises planting the seeds with the hypertensive response **elicitor protein** or **polypeptide** in natural or artificial soil and propagating **plants** from seeds planted in soil. The stress resistance is chosen from climate related stress (e.g. drought, water, frost, cold or high temperature and excessive or insufficient light), air pollution stress (e.g. CO2, CO, SO2, NOx, hydrocarbons, ozone, ultraviolet radiation and acidic rain), chemical stress (e.g. insecticides, herbicides, fungicides and heavy metals) and nutritional stress (e.g. caused by fertilizers, micronutrients or macronutrients). The **plant** is chosen from 47 species including alfalfa, rice, wheat, etc., or Arabidopsis thaliana, Saintpaulia, petunia, pelargonium, poinsettia, chrysanthemum, carnation and zinnia.

L18 ANSWER 11 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-328939 [28] WPIDS
CR 2002-257464 [25]
DNC C2000-099671
TI Novel hypersensitive response **elicitor** polynucleotides and **polypeptides** used to improve disease resistance, insect resistance, and growth of **plants**.
DC C06 D16 P13
IN FAN, H; SWANSON, S; WEI, Z; SWANSON, S S
PA (EDEN-N) EDEN BIOSCIENCE CORP; (FANH-I) FAN H; (SWAN-I) SWANSON S S; (WEIZ-I) WEI Z
CYC 88
PI WO 2000020616 A1 20000413 (200028)* EN 31p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW
AU 9962928 A 20000426 (200036)
EP 1119632 A1 20010801 (200144) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ZA 2001002711 A 20020130 (200217) 40p
HU 2001003789 A2 20020128 (200222)
US 2002066122 A1 20020530 (200240)
ADT WO 2000020616 A1 WO 1999-US23265 19991005; AU 9962928 A AU 1999-62928 19991005; EP 1119632 A1 EP 1999-950223 19991005, WO 1999-US23265 19991005; ZA 2001002711 A ZA 2001-2711 20010403; HU 2001003789 A2 WO 1999-US23265 19991005, HU 2001-3789 19991005; US 2002066122 A1 Provisional US 1998-103124P 19981005, CIP of US 1999-412452 19991004, Provisional US 2000-224053P 20000809, US 2001-829124 20010409
FDT AU 9962928 A Based on WO 200020616; EP 1119632 A1 Based on WO 200020616; HU 2001003789 A2 Based on WO 200020616
PRAI US 1998-103124P 19981005; US 1999-412452 19991004; US 2000-224053P 20000809; US 2001-829124 20010409
AB WO 200020616 A UPAB: 20020626

NOVELTY - Isolated **Xanthomonas** campestris hypersensitive response **elicitor protein** or **polypeptide** (I) , is new.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of imparting disease resistance to **plants**, enhancing **plant** growth, or controlling insects for **plants**, comprising applying (I) in a non-infectious form to a **plant** or **plant** seed.

ACTIVITY - Antifungal; antiviral; antibacterial; insecticide; growth enhancer.

MECHANISM OF ACTION - Hypersensitive response elicitor.

USE - The hypersensitive response **elicitor** polynucleotides, **polypeptides**, and methods can be used to impart disease resistance to **plants**, for enhancing **plant** growth, and for effecting insect control for **plants**. The **polypeptide** may be applied to the **plants** to produce these effects, or the polynucleotide may be used to produce transgenic **plants**. Resistance to a wide variety of pathogens is imparted, including viruses, bacteria and fungi, e.g. Tobacco mosaic virus, Tomato mosaic virus, **Pseudomonas** solancearum, P. syringae pv. Tabaci, Xanthamonas campestris pv. Pelargonii, Fusarium oxysporum, and **Phytophthora** infestans. The polynucleotides, **polypeptides** and methods can also be used to increase growth of a **plant**, e.g. to increase yield and seed production, and produce earlier fruit production and **plant** maturation. The polynucleotides, **polypeptides** and methods are also effective against a wide variety of insects, such as European corn borer, beet armyworm, cabbage looper, corn ear worm, fall armyworm, diamondback moth, cabbage root maggot, onion maggot, seed corn maggot, pickleworm, pepper maggot, tomato pinworm, and maggots. **Plants** which can be untreated include both dicots and monocts, such as cereals, rice, vegetables, and ornamental **plants**.

ADVANTAGE - The polynucleotides, polypeptides and methods may be used to treat previously untreatable diseases, or for treating diseases systemically which might not have been treated with prior art methods due to cost. The invention also avoids the use of infectious agents or environmentally harmful agents.

Dwg.0/0

TECH UPTX: 20000613

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Peptide: (I) which has a molecular weight of 13-15 kDa, and has the amino acid sequence of (Ia).

Met-Asp-Glu-Ile-Glu-Asn-His-Phe-Ser-Asn (Ia)

Preferred Method: The **plants** are treated during the application of the peptide. The method further comprises planting the treated seeds in natural or artificial soil, and propagating **plants** from the planted seeds.

L18 ANSWER 12 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-303745 [26] WPIDS
DNN N2000-226915 DNC C2000-092264
TI Hypersensitive response **elicitor polypeptides** useful for imparting enhanced growth, disease resistance and insect resistance to **plants**, especially vegetables and ornamental flowers.
DC C06 D16 P13
IN FAN, H; NIGGEMEYER, J L; WEI, Z
PA (EDEN-N) EDEN BIOSCIENCE CORP
CYC 87
PI WO 2000020452 A2 20000413 (200026)* EN 99p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB

GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW

AU 9965085 A 20000426 (200036)
NO 2001001729 A 20010605 (200138)
EP 1119582 A2 20010801 (200144) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
BR 9915345 A 20010731 (200146)
KR 2001080011 A 20010822 (200213)
ZA 2001002536 A 20020227 (200223) 120p
CN 1329619 A 20020102 (200227)
HU 2001004245 A2 20020328 (200234)
JP 2002526101 W 20020820 (200258) 112p

ADT WO 2000020452 A2 WO 1999-US23181 19991005; AU 9965085 A AU 1999-65085 19991005; NO 2001001729 A WO 1999-US23181 19991005, NO 2001-1729 20010405; EP 1119582 A2 EP 1999-953057 19991005, WO 1999-US23181 19991005; BR 9915345 A BR 1999-15345 19991005, WO 1999-US23181 19991005; KR 2001080011 A KR 2001-704332 20010404; ZA 2001002536 A ZA 2001-2536 20010328; CN 1329619 A CN 1999-814028 19991005; HU 2001004245 A2 WO 1999-US23181 19991005, HU 2001-4245 19991005; JP 2002526101 W WO 1999-US23181 19991005, JP 2000-574563 19991005

FDT AU 9965085 A Based on WO 200020452; EP 1119582 A2 Based on WO 200020452; BR 9915345 A Based on WO 200020452; HU 2001004245 A2 Based on WO 200020452; JP 2002526101 W Based on WO 200020452

PRAI US 1998-103050P 19981005

AB WO 200020452 A UPAB: 20000531

NOVELTY - An isolated fragment of a hypersensitive response **elicitor polypeptide** (I), which does not elicit a hypersensitive response but has other activity in **plants**, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) an isolated DNA molecule (II) encoding (I);
(2) an expression system (III) transformed with (II);
(3) a host cell (IV) transformed with (II);
(4) a transgenic **plant** (V) transformed with (II);
(5) a transgenic seed (VI) transformed with (II);
(6) a method (VII) of imparting disease resistance to a **plant** comprising applying (I) (which does not elicit a hypersensitive response) in a non-infectious form to a **plant** or seed under conditions that will impart disease resistance;
(7) a method (VIII) of enhancing **plant** growth, comprising applying (I) (which does not elicit a hypersensitive response) in a non-infectious form to a **plant** or seed under conditions that will impart enhanced growth;
(8) a method (IX) of insect control for insects comprising applying (I) (which does not elicit a hypersensitive response) in a non-infectious form to a **plant** or seed under conditions that will effectively control insects; and
(9) **plants** and seeds produced by (VII), (VIII) and/or (IX).

ACTIVITY - Antimicrobial; growth stimulant; insecticidal.

C-terminal fragments of (I) enhanced the growth of tomato by 9-21%, N-terminal fragments enhanced growth by 4-13% and internal fragments enhanced growth by 9-20%.

MECHANISM OF ACTION - Elicitor; gene therapy.

USE - (I) may be used to impart disease resistance, enhanced growth and/or insect control characteristics to **plants**. The **plants** which may be treated in this way include vegetables, crops and ornamental **plants** such as alfalfa, rice, wheat, barley, rye,

cotton, sunflower, peanut, corn, potato, sweet potato, bean, pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, turnip, cauliflower, broccoli, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum or sugarcane, Arabidopsis thaliana, Saintpaulia, petunia, pelargonium, poinsettia, chrysanthemum, carnation or zinnia (claimed). Dwg.0/2

TECH UPTX: 20000531

TECHNOLOGY FOCUS - BIOLOGY - Isolation: (I) is isolated from an **Erwinia** (especially E. amylovora), **Pseudomonas** (especially P. syringae), Xanthomanas or **Phytophthora**.
Preferred **Plants**: (V) and (VI) are preferably alfalfa, rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean, pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, turnip, cauliflower, broccoli, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus, strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum or sugarcane. Additionally, the **plant** and seed may be Arabidopsis thaliana, Saintpaulia, petunia, pelargonium, poinsettia, chrysanthemum, carnation or zinnia.

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred **Polypeptides**: If the **elicitor** is derived from E. amylovora, (I) is preferably a C-terminal fragment of a defined 403 amino acid sequence (Ix) given in the specification, an N-terminal fragment of (Ix) or an internal fragment of (Ix). The C-terminal fragment comprises amino acids 169-403, 210-403, 267-403 or 343-403 of (Ix). The internal fragment comprises amino acids 105-179, 137-166, 121-150 or 137-156 of (Ix). If the **elicitor** is derived from P. syringae, (I) preferably comprises amino acids 190-294 of a defined 341 amino acid sequence (Iy) given in the specification.
Preferred Nucleic Acids: In (III), (II) is positioned in the proper sense orientation and correct reading frame.
Preferred Cells: (IV) is preferably a **plant** cell or a bacterial cell. (II) is preferably transformed with an expression system (i.e. (III)).
Preferred Methods: In (VII), (VIII) and (IX), the **plants** are treated during application. (VII), (VIII) and (IX) further comprise planting the seeds treated with (I) in natural or artificial soil and propagating **plants** from the seeds in the soil. Preferably, (VII), (VIII) and (IX) comprise:
(A) producing a transgenic **plant** or seed transformed with (II); and
(B) growing the transgenic **plants** or seeds under conditions that impart disease resistance, enhanced growth and/or insect control.
Preparation: (I) and the nucleic acids (II) that encode it may be produced according to standard methodologies.

L18 ANSWER 13 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-293162 [25] WPIDS
DNC C2000-088685
TI Inducing resistance to vascular wilt disease in **plants** using elicitors derived from fungus implicated in the pathogenesis of Dutch Elm Disease.
DC C04 D16
IN HUBBES, M
PA (UTOR) UNIV TORONTO GOVERNING COUNCIL
CYC 90
PI WO 2000018928 A1 20000406 (200025)* EN 31p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL

OA PT SD SE SL SZ TZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
AU 9958440 A 20000417 (200035)
EP 1115869 A1 20010718 (200142) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ADT WO 2000018928 A1 WO 1999-CA884 19990927; AU 9958440 A AU 1999-58440 19990927; EP 1115869 A1 EP 1999-945798 19990927, WO 1999-CA884 19990927
FDT AU 9958440 A Based on WO 200018928; EP 1115869 A1 Based on WO 200018928
PRAI US 1998-160246 19980925
AB WO 200018928 A UPAB: 20000524
NOVELTY - A method (I) for inducing resistance to vascular wilt disease in a susceptible **plant**, comprising administering an elicitor (or fragment or analogue) obtained from a Dutch Elm Disease (DED)-causing fungus, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) an isolated nucleic acid (II) comprising a sequence encoding a glycoprotein elicitor obtained from a DED-causing fungus;

(2) a vector (III) comprising (II);

(3) a host cell comprising (III);

(4) a purified protein (IV) comprising an amino acid sequence with at least 70% homology to a defined sequence given in the specification (or a fragment); and

(5) a method of preparing a glycoprotein elicitor, comprising culturing Ophiostoma ulmi fungus and harvesting the glycoprotein elicitor from the culture filtrate.

ACTIVITY - Fungicidal.

MECHANISM OF ACTION - Vaccine, it has been shown previously (see Patent Number CA9800284) that the DED-producing fungus Ophiostoma ulmi produces elicitor compounds that can elicit a defence reaction in elm trees and the trees produce compounds inhibitory to the fungus and are therefore able to resist infection. It has now been found that this glycoprotein can be useful in stimulating resistance to other diseases.

Golden delicious apples seedlings were grown in a greenhouse and treated by injection (20 microliters), at the seventh leaf below the apex, with 2 micrograms/20 microliters of O. ulmi Q412 elicitor (negative control). 7 Days after treatment, the treated seedlings and a group of untreated positive controls were challenged by injecting an aggressive strain of **Erwinia** amylovora at the apex leaf (20 microliters inoculant containing 200000 bacteria).2 Weeks after challenge with the bacteria, disease symptoms were rated on a disease index scale (as described in the specification). It was found that 100% of the negative controls were undiseased, compared to 100% of the positive controls that were diseased.

USE - (I) is used for inducing resistance to vascular wilt disease in a susceptible **plant** such as a tree, woody perennial **plant** or non-woody **plant**, especially fruit trees such as apple and pear trees. The wilt disease treated is caused by Verticillium spp., Ceratocystis fagacearum, Fusarium spp.. In particular (I) is used to induce resistance to Fire Blight Disease (caused by **Erwinia** amylovora) in members of the Rosaeae family (claimed) such as the genera Malus (apples), Pyrus (pears) Prunus (apricots, cherries and plums), and Rosa (roses).

Dwg.0/0

TECH UPTX: 20000524
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: In (I), the

elicitor used is a glycoprotein **elicitor** produced by a non-aggressive strain of the fungus Ophiostoma ulmi. The **elicitor** may be obtained from a culture filtrate of Ophiostoma strain Q412. The **elicitor** comprises a defined 409 amino acid sequence given in the specification.
Preferred Nucleic Acids: (II) comprises either:
(a) a nucleotide sequence encoding a **protein** comprising a defined amino acid sequence given in the specification (or a functional fragment); or
(b) a sequence encoding a glycoprotein **elicitor** and capable of hybridizing to a sequence complementary to a sequence of (a) under stringent hybridization conditions.
(II) comprises 1 of 2 defined sequences given in the specification.
Preferred **Proteins**: (IV) may be glycosylated.

L18 ANSWER 14 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 2000-256651 [22] WPIDS
CR 2000-256650 [22]
DNN N2000-190820 DNC C2000-078322
TI Identification of non-host **plant** disease resistance genes comprises expressing resistance and non-host inducible genes in susceptible **plants**.
DC C06 D16 P13
IN ROMMENS, C M T; SWORDS, K M M; YAN, H; ZHANG, B
PA (MONS) MONSANTO CO
CYC 88
PI WO 2000012736 A2 20000309 (200022)* EN 94p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW
AU 9957960 A 20000321 (200031)
EP 1108044 A2 20010620 (200135) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
BR 9913653 A 20010605 (200138)
JP 2002523103 W 20020730 (200264) 119p
ADT WO 2000012736 A2 WO 1999-US19899 19990831; AU 9957960 A AU 1999-57960 19990831; EP 1108044 A2 EP 1999-945345 19990831, WO 1999-US19899 19990831; BR 9913653 A BR 1999-13653 19990831, WO 1999-US19899 19990831; JP 2002523103 W WO 1999-US19899 19990831, JP 2000-567722 19990831
FDT AU 9957960 A Based on WO 200012736; EP 1108044 A2 Based on WO 200012736; BR 9913653 A Based on WO 200012736; JP 2002523103 W Based on WO 200012736
PRAI US 1998-98402P 19980831
AB WO 200012736 A UPAB: 20021105
NOVELTY - A method for identifying a nucleic acid sequence encoding a **protein** conferring resistance against a **plant** pathogen or **elicitor** comprises expressing resistance (R) and non-host inducible genes in susceptible **plants** to identify genes that have functional activity against a pathogen of interest.
DETAILED DESCRIPTION - The method comprising:
(a) selecting a non-host **plant** resistant to the pathogen or elicitor of interest;
(b) recovering full-length resistance gene homologues present in the resistant **plant**;
(c) screening the homologues for functionality by transforming tissue of a pathogen-susceptible **plant** with the homologues;
(d) challenging the transformed tissue with elicitor or pathogen; and

(e) observing functional activity against the pathogen of interest.

INDEPENDENT CLAIMS are also included for the following:

(1) a nucleic acid segment (I) conferring non-host disease resistance to **plants** by responding to an avirulence gene in **plant** pathogens;

(2) a nucleic acid segment comprising 10 partial tobacco R-gene homologue sequences, 10 sequences representing 10 different subclasses of class I R-gene homologues or 6 sequences representing 6 different subclasses of class II R-gene homologues, an Enh3 genomic sequence, TOB-F12 DNA or an Nhr1 gene or their complements or sequences that hybridize under conditions of high stringency, all sequences fully defined in the specification;

(3) a recombinant DNA expression system comprising an expression vector into which is inserted a heterologous DNA conferring non-host disease resistance to **plants** by responding to an avirulence gene in **plant** pathogens;

(4) a cell transformed with a heterologous DNA of (3);

(5) a transgenic **plant** transformed with (I); and

(6) **plants** transformed with R-genes isolated by the novel method, which render the **plants** resistant to pathogen of interest.

USE - The method is useful for isolating disease resistance genes in **plants**. The nucleic acid sequences identified by the method confer non-host disease resistance to **plants** by responding to avirulence genes in **plant** pathogens. The R-genes identified trigger a hypersensitive response in tobacco that is dependent on the presence of the P. infestans elicitor INF1. The sequences are useful for generating transgenic **plants** that are resistant to such pathogens. The transgenic **plants** are preferably Acacia, apple, banana, barley, bean, broccoli, cabbage, canola, carrot, citrus, coffee, corn, cotton, cucumber, Douglas fir, Eucalyptus, garlic, grape, Loblolly pine, melon, oat, oil palm, onion, an ornamental **plant**, pea, peanut, pepper, Poplar tree, potato, Radiata pine, rice, rye, sorghum, Southern pine, soybean, strawberry, sugarbeet, sugarcane, sunflower, Sweetgum, tea, tomato, turf, a vine and wheat. The DNA sequences are also useful for identifying related nucleic acid sequences that confer resistance to fungal pathogens on **plant** cells. The resistance genes can be used to control viral, fungal, bacterial or nematodal pathogens, including **Phytophthora**, Erisyphe, Puccinia, Septoria, Ustilago, Melampsora, Bremia, Venturia, Uromyces, Tilletia, Rhynchosporium, Pyrenophora, Fulvia, Fusarium oxysporum, Peronospora, **Pseudomonas** syringae, **Xanthomonas**, Cladosporium, Colletotrichium, tobacco mosaic virus, potato virus Y and X, Phialophora, Heterodera, Magnaporthe, brown **plant** hopper, green rice leafhopper, aphids, Pseudocercosporella and hessian fly.

ADVANTAGE - None given.

Dwg.0/7

TECH UPTX: 20000508

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Method: The **plant** resistant to the pathogen or elicitor of interest demonstrates resistance with a hypersensitive response and is preferably tobacco or Solanum microdontum accession 498124. The pathogen of interest is **Phytophthora** infestans. The transformation is Agrobacterium-mediated. The pathogen susceptible **plant** is Nicotiana benthamiana. The challenge with the elicitor is done by co-transformation with gene for the elicitor. The elicitor is INF1. The functional activity can be identified by the presence of a pathogen- or elicitor-dependent hypersensitive response.

L18 ANSWER 15 OF 21 WPIDS (C) 2003 THOMSON DERWENT

AN 1999-633875 [54] WPIDS
CR 1999-603273 [52]
DNC C1999-185133
TI Use of phosphorous acid derivative to amplify **plant** defence response.
DC C03
IN FRITIG, B; KOPP, M; LABOURDETTE, G; LATORSE, M; SAINDRENAN, P
PA (RHON) RHONE-POULENC AGROCHIMIE; (AVET) AVENTIS CROPSCIENCE SA
CYC 84
PI WO 9953761 A1 19991028 (199954)* FR 50p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
AU 9931526 A 19991108 (200014)
BR 9909722 A 20001226 (200103)
EP 1071332 A1 20010131 (200108) FR
R: AT BE CH DE DK ES FR GB GR IE IT LI NL PT
HU 2001001671 A2 20010928 (200168)
KR 2001042762 A 20010525 (200168)
ZA 2000006209 A 20020227 (200223)# 90p
JP 2002511495 W 20020416 (200242) 62p
MX 2000010030 A1 20011101 (200279)
ADT WO 9953761 A1 WO 1999-FR844 19990412; AU 9931526 A AU 1999-31526 19990412; BR 9909722 A BR 1999-9722 19990412, WO 1999-FR844 19990412; EP 1071332 A1 EP 1999-913385 19990412, WO 1999-FR844 19990412; HU 2001001671 A2 WO 1999-FR844 19990412, HU 2001-1671 19990412; KR 2001042762 A KR 2000-711495 20001016; ZA 2000006209 A ZA 2000-6209 20001101; JP 2002511495 W WO 1999-FR844 19990412, JP 2000-544189 19990412; MX 2000010030 A1 MX 2000-10030 20001013
FDT AU 9931526 A Based on WO 9953761; BR 9909722 A Based on WO 9953761; EP 1071332 A1 Based on WO 9953761; HU 2001001671 A2 Based on WO 9953761; JP 2002511495 W Based on WO 9953761
PRAI FR 1999-1811 19990211; FR 1998-5043 19980416; ZA 2000-6209 20001101
AB WO 9953761 A UPAB: 20021209
NOVELTY - Use of antifungal and/or antibacterial and/or antiviral agents B to potentiate the physiological reponses of **plants** elicited by compounds A, is new.

ACTIVITY - Fungicidal, and/or bactericidal, and/or viricidal.

MECHANISM OF ACTION - A sensitizes the **plant** to possible attack (hypersensitivity reaction (HR)) and B causes an augmentation in this reaction.

USE - The combination of A and B is used to treat or prevent, especially to prevent, phytopathogenic fungi, and/or bacteria, and/or viruses by application to the aerial parts of **plants**. The following crops can be treated: cereals (wheat, barley, maize, rice), vegetables (haricots, onions, cabbage, potatoes, Cucurbitaceae, tomatoes, peppers, spinach, peas, lettuce, celery, endive), soft fruit (strawbrries, raspberries), trees (apple, pear, cherry, citrus, ginseng, coconut palms, pecan, cacao, walnut, rubber, banana, olive, poplar), vines, sunflowers, beet, tobacco, and ornamental cultures.

ADVANTAGE - A and B function in synergy, hence they can be used in smaller quantity with cost and environmental benefit. The combination reduces the risk of development of resistant fungal strains.

Dwg.0/21
TECH UPTX: 19991221
TECHNOLOGY FOCUS - AGRICULTURE - Preferred **elicitors** A: A are

proteins, oligosaccharides (preferably trehalose), polysaccharides (preferably Elexa), lipids, glycolipids, glycoproteins, **peptides**, vegetable and/or fungal cell wall extract, fungi, Bion and/or its analogue, yeast extracts, salicylic acid and/or its esters, seaweed extracts (preferably Agrimer 540, Agrotonic, CAL, Laminaria sp. (L. digitalis, L. saccharina, L.hyperborea), Ascophyllum sp. (A. nodosum), Himanthalla sp. (H. elongata), Undaria sp. (U. pinnatifida), Fucus sp. (F. vesiculum), Ulva sp., Chondrus sp., Enteromorphe sp.).
Preferred potentiators B: B are derivatives of phosphorous acid such as metallic phosphites, e.g. Al-phosetyl, Na-phosetyl, phosphorous acid and its alkaline and alkaline earth metal salts, Bion and its analogues, Elexa, isonicotinic acid, aminobutyric acid or methyl jasmonate.
Preferred combinations: For a combination, B is Na-phosetyl, phosphorous acid, or Bion, and A is (i) beta-glucane type oligosaccharide isolated from the walls of **Phytophthora** megasperma (Pmg), (ii) a pectin oligomer, or (iii) beta-megaspermine; or B is phosphorous acid, Al-phosetyl, or Elexa, and A is Elexa, Bion, salicylic acid or one or more of its esters, yeast extract, trehalose, or spores of a non-host fungus; the combination of A and B may also include a conventional fungicide, or a conventional fungicide may be applied separately.

L18 ANSWER 16 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1999-603273 [52] WPIDS
CR 1999-633875 [54]
DNC C1999-175746
TI Increasing **plant** physiological responses to elicitors using antifungal and/or antibacterial and/or antiviral agents.
DC C03
IN FRITIG, B; KOPP, M; LABOURDETTE, G; LATORSE, M; SAINDRENAN, P; LATORSE, M P
PA (AVET) AVENTIS CROPSCIENCE SA; (RHON) RHONE-POULENC AGROCHIMIE
CYC 3
PI FR 2777423 A1 19991022 (199952)* 46p
BR 9909722 A 20001226 (200103)
KR 2001042762 A 20010525 (200168)
ADT FR 2777423 A1 FR 1998-5043 19980416; BR 9909722 A BR 1999-9722 19990412, WO 1999-FR844 19990412; KR 2001042762 A KR 2000-711495 20001016
FDT BR 9909722 A Based on WO 9953761
PRAI FR 1998-5043 19980416; FR 1999-1811 19990211
AB FR 2777423 A UPAB: 20011121
NOVELTY - One or more antifungal and/or antibacterial and/or antiviral agents (B) is used as amplifier for the physiological response of **plants** obtained following application of an elicitor (A).
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:
(1) a composition containing the agents (A) and (B); and
(2) a process for treating **plants** using this composition.
ACTIVITY - Antifungal; antibacterial; virucide. Nicotinia tabacum cells were suspended in a culture medium and cultivated in darkness in the presence of H3PO3 (5 mM) and/or a beta -glucan oligosaccharide (10 mu g/ml) isolated from the walls of **Phytophthora** megasperma (Pmg).
The PAL activity was measured after the oligosaccharide had been added, and showed that phosphorous acid alone had no effect, but the combination had a greater effect and was longer lasting than when the Pmg oligosaccharide was used alone.
MECHANISM OF ACTION - The composition induces the natural defense mechanisms of the **plant**, such as activation of phenyl alanine ammonia-lyase (PAL), and activation of lipoxygenase (LOX).
USE - Useful for treating e.g. cereals, vegetables, fruits, trees, vines, sunflowers, beets, tobacco and ornamental **plants** with antifungal, antibacterial and virucidal agents.

ADVANTAGE - The composition allows a synergism effect between (A) and (B).
Dwg.0/21

TECH UPTX: 19991210
TECHNOLOGY FOCUS - AGRICULTURE - Preferred Composition: Typical **elicitors** (A) are **proteins**, oligosaccharides, (especially trehalose), polysaccharides (especially Elexa (RTM)), lipids, glycolipids, glycoproteins, **peptides**, extracts vegetable and/or fungal wall tissue, fungi, Bion (RTM) and its analogues, yeast extracts, salicylic acid and/or its esters. Typical compounds (B) include phosphorous acid and its derivatives, such as metal phosphites (especially fosetyl-Al and fosetyl-Na), alkali and alkaline earth metal salts of phosphorous acid, Bion(RTM) and its analogues, Elexa (RTM), isonicotinic acid, aminobutyric acid, and methyl jasmonate. If desired treatment with (A) and (B) may be completed by treatment with a known fungicide, simultaneously or separately. The composition preferably contains an active material (0.05-95 %), together with supports and surfactants.

L18 ANSWER 17 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1999-591325 [50] WPIDS
DNN N1999-436117 DNC C1999-172774
TI New pathogen-inducible promoter conferring pathogen resistance to a **plant**.
DC C06 D16 P13
IN CUSTERS, J; SIMONS, L H; STUIVER, M H
PA (MOGE-N) MOGEN INT NV; (ZENE) ZENECA MOGEN BV; (ZENE) ZENECA MOGEN NV; (SYGN) SYNGENTA MOGEN BV
CYC 87
PI WO 9950428 A2 19991007 (199950)* EN 45p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
AU 9934190 A 19991018 (200010)
BR 9909360 A 20001212 (200102)
EP 1062356 A2 20001227 (200102) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
CN 1295621 A 20010516 (200146)
JP 2002509728 W 20020402 (200225) 55p
ZA 2000005113 A 20020327 (200230) 64p
US 6465636 B1 20021015 (200271)
MX 2000009576 A1 20011201 (200282)
ADT WO 9950428 A2 WO 1999-EP2178 19990325; AU 9934190 A AU 1999-34190 19990325; BR 9909360 A BR 1999-9360 19990325, WO 1999-EP2178 19990325; EP 1062356 A2 EP 1999-915723 19990325, WO 1999-EP2178 19990325; CN 1295621 A CN 1999-804665 19990325; JP 2002509728 W WO 1999-EP2178 19990325, JP 2000-541316 19990325; ZA 2000005113 A ZA 2000-5113 20000922; US 6465636 B1 WO 1999-EP2178 19990325, US 2000-647390 20000929; MX 2000009576 A1 MX 2000-9576 20000929
FDT AU 9934190 A Based on WO 9950428; BR 9909360 A Based on WO 9950428; EP 1062356 A2 Based on WO 9950428; JP 2002509728 W Based on WO 9950428; US 6465636 B1 Based on WO 9950428
PRAI EP 1998-201024 19980401
AB WO 9950428 A UPAB: 19991201
NOVELTY - A DNA fragment naturally driving the expression of a **plant** gene coding for hexose oxidase. The DNA is capable of promoting pathogen-inducible transcription of an associated DNA sequence

when re-introduced into a **plant**.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) A portion or variant of the DNA fragment capable of promoting pathogen-inducible transcription of an associated DNA when re-introduced into a **plant**;

(2) A chimeric DNA sequence comprising in the direction of transcription the DNA fragment/portion/variant, and a DNA sequence to be expressed under the transcriptional control of the fragment;

(3) A replica comprising a chimeric DNA sequence;

(4) A replica comprising in the direction of transcription a DNA fragment and at least one recognition site for a restriction endonuclease for insertion of a DNA sequence to be expressed under the control of the DNA fragment.

(5) A microorganism containing a replicon;

(6) A **plant** cell having a chimeric DNA sequence incorporated into its genome;

(7) A **plant** consisting of cells of claim (5);

(8) A part of a **plant** selected from seeds, flowers, tubers, roots, leaves, fruits, pollen and wood;

(9) A method for identifying homologues capable of promoting pathogen-induced transcription in a **plant**.

ACTIVITY - Inhibition. The hexose oxidase is toxic to (fungal) pathogens. A selection of in vitro plantlets were infected with the potato late blight causing fungus **Phytophthora** infestans. Leaves which showed disease symptoms were removed and stained for expression of the GUS gene by histochemical analysis. Results showed that the ms59 promoter responded to fungal infection but the level of induced expression was low.

USE - The chimeric DNA sequence can be used to transform **plants**. Also, for conferring pathogen resistance to a **plant** when the DNA sequence to be expressed causes the production of an antiopathogenic protein. The portion or variant of DNA can be used for making hybrid regulatory DNA sequences.

ADVANTAGE - Previously employed promoters in similar studies have the disadvantage that they also active constitutively do not react to certain types of pathogens. An advantage of the promoters in this invention is that they regulate expression very soon after pathogen infection.

Dwg.0/1

TECH UPTX: 19991201

TECHNOLOGY FOCUS - BIOLOGY - Preferred species - The DNA fragment is obtained from Helianthus annus or Lactuca sativa. Preferred **plant** - The **plant** is dicotyledonous.

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred DNA fragment - The DNA fragment, portion or variant is the upstream regulatory region of the gene coding for hexose oxidase, denoted as WL64 and MS59, in H.annuus and L.sativa, respectively. Preferred chimeric DNA - The DNA sequence to be expressed within the chimeric DNA causes the production of an antipathogenic **protein** selected from the following group: chitinase, glucanase, osmotin, magainins, lectins, saccharide oxidase, oxalate oxidase, toxins from Bacillus thuringiensis antifungal **proteins** siolated from Mirabilis jalapa, Amaranthus, Raphanus, Brassica, Sinapis, Arabidopsis, Dahlia, Cnicus, Lathyrus, Clitoria, Allium seeds, Aralia and Impatiens and albumin-type **proteins** such as thionine, napin, barley trypsin inhibitor, cereal gliadin and wheat alpha-amylase. The chimeric DNA sequence causes the production of a **protein** that can induce a hypersensitive response selected from the following group: Cf, Ba3 and Pto **proteins** from tomato, Rpm1 and Rps2 from Arabidopsis thaliana, N-**protein** from tobacco, avr **proteins** from Cladosporium fluvum, harpins from **Erwinia** and **elicitor proteins** (avrBs3, avrRpm1, avrRpt2) from

Pseudomonas or **Xanthomonas**.

L18 ANSWER 18 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1999-243578 [20] WPIDS
DNC C1999-070961
TI Imparting disease resistance to **plants**.
DC C06 D16
IN BEER, S V; BUTLER, J L
PA (CORR) CORNELL RES FOUND INC; (EDEN-N) EDEN BIOSCIENCE CORP
CYC 82
PI WO 9911133 A1 19990311 (199920)* EN 26p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW
AU 9890268 A 19990322 (199931)
FI 2000000494 A 20000331 (200031)
EP 1009237 A1 20000621 (200033) EN
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
BR 9811434 A 20000822 (200050)
AU 726360 B 20001102 (200062)
CN 1280459 A 20010117 (200128)
KR 2001023569 A 20010326 (200161)
JP 2001514197 W 20010911 (200167) 36p
US 6333302 B1 20011225 (200206)
ADT WO 9911133 A1 WO 1998-US17252 19980820; AU 9890268 A AU 1998-90268 19980820; FI 2000000494 A WO 1998-US17252 19980820, FI 2000-494 20000303; EP 1009237 A1 EP 1998-942153 19980820, WO 1998-US17252 19980820; BR 9811434 A BR 1998-11434 19980820, WO 1998-US17252 19980820; AU 726360 B AU 1998-90268 19980820; CN 1280459 A CN 1998-810797 19980820; KR 2001023569 A KR 2000-702217 20000302; JP 2001514197 W WO 1998-US17252 19980820, JP 2000-508250 19980820; US 6333302 B1 Provisional US 1997-57464P 19970903, US 1998-136625 19980819
FDT AU 9890268 A Based on WO 9911133; EP 1009237 A1 Based on WO 9911133; BR 9811434 A Based on WO 9911133; AU 726360 B Previous Publ. AU 9890268, Based on WO 9911133; JP 2001514197 W Based on WO 9911133
PRAI US 1997-57464P 19970903; US 1998-136625 19980819
AB WO 9911133 A UPAB: 19990525
NOVELTY - Imparting disease resistance to **plants** comprising applying a hypersensitive response **elicitor protein** or **polypeptide** from Gram positive bacterium, in a non-infectious form, to a **plant** or **plant** seed, so that the **protein** or **polypeptide** contacts the cells of the **plant** or seed, is new.

USE - The method can be utilized to treat a wide variety of **plants** or their seeds to impart disease resistance, enhance growth, and/or control insects. Suitable **plants** include dicotyledons and monocotyledons. More particularly, useful crop **plants** can include: alfalfa, rice, wheat, barley, rye, cotton, sunflower, peanut, corn, potato, sweet potato, bean, pea, chicory, lettuce, endive, cabbage, brussel sprout, beet, parsnip, turnip, cauliflower, broccoli, turnip, radish, spinach, onion, garlic, eggplant, pepper, celery, carrot, squash, pumpkin, zucchini, cucumber, apple, pear, melon, citrus. strawberry, grape, raspberry, pineapple, soybean, tobacco, tomato, sorghum, and sugarcane. Ornamental **plants** are: Arabidopsis thaliana, Saintpaulia, petunia, pelargonium, pointsettia, chrysanthemum, carnation and zinnia. The method imparts resistance to pathogens including viruses (e.g. Tobacco mosaic virus and Tomato mosaic

virus), bacteria (e.g. **Pseudomonas** sola ncearum and Xanthamonas campestris pv. Pelargonii) and fungi (Fusarium oxysporum and **Phytophthora** infestans).

ADVANTAGE - Seeds of treated **plants** will carry the disease resistance into the next **plants** generated from them. The method can be used as part of other treatments applied to the **plants** and seeds.

Dwg.0/0

TECH UPTX: 19990517

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred method: The protein or polypeptide is applied to the **plant** during a treatment. Seeds are treated with the protein or polypeptide prior to planting in natural or artificial soil, to propagate **plants** from the seeds. Preferred materials: The Gram positive bacterium is **Clavibacter**, especially C. michiganensis ssp. sepedonicus.

L18 ANSWER 19 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1999-070210 [06] WPIDS
DNC C1999-020744
TI New fragments of an **Erwinia** hypersensitive response **elicitor protein** and related DNA - used to impart disease resistance to **plants**, to increase their growth and to control insects.
DC C06 D16
IN BEER, S V; LABY, R J; WEI, Z
PA (CORR) CORNELL RES FOUND INC; (EDEN-N) EDEN BIOSCIENCE CORP; (BEER-I) BEER S V; (LABY-I) LABY R J; (WEIZ-I) WEI Z
CYC 83
PI WO 9854214 A2 19981203 (199906)* EN 94p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW
AU 9877004 A 19981230 (199918)
FI 9902545 A 20000128 (200020)
EP 996729 A2 20000503 (200026) EN
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
BR 9809699 A 20000711 (200041)
CN 1265145 A 20000830 (200059)
US 2001011380 A1 20010802 (200147)
KR 2001013226 A 20010226 (200154)
JP 2002501388 W 20020115 (200207) 109p
MX 9911007 A1 20010601 (200235)
AU 750732 B 20020725 (200260)
NZ 501138 A 20021122 (200301)
ADT WO 9854214 A2 WO 1998-US10874 19980528; AU 9877004 A AU 1998-77004 19980528; FI 9902545 A WO 1998-US10874 19980528, FI 1999-2545 19991129; EP 996729 A2 EP 1998-924950 19980528, WO 1998-US10874 19980528; BR 9809699 A BR 1998-9699 19980528, WO 1998-US10874 19980528; CN 1265145 A CN 1998-807613 19980528; US 2001011380 A1 Provisional US 1997-48109P 19970530, US 1998-86118 19980528; KR 2001013226 A KR 1999-711216 19991130; JP 2002501388 W WO 1998-US10874 19980528, JP 1999-500902 19980528; MX 9911007 A1 MX 1999-11007 19991129; AU 750732 B AU 1998-77004 19980528; NZ 501138 A NZ 1998-501138 19980528, WO 1998-US10874 19980528
FDT AU 9877004 A Based on WO 9854214; EP 996729 A2 Based on WO 9854214; BR 9809699 A Based on WO 9854214; JP 2002501388 W Based on WO 9854214; AU 750732 B Previous Publ. AU 9877004, Based on WO 9854214; NZ 501138 A Based on WO 9854214

PRAI US 1997-48109P 19970530; US 1998-86118 19980528
AB WO 9854214 A UPAB: 19990224
Isolated fragment (I) of an **Erwinia** hypersensitive response **elicitor protein** or **polypeptide** (A) able to elicit a hypersensitive response in **plants** is new. Also new are: (1) isolated DNA (II) encoding (I); and (2) expression systems, host cells and transgenic **plants** (or their seeds) containing (II).
USE - (I), in non-infectious form, is applied to **plants** to impart disease resistance (to a wide range of viral, bacterial and fungal pathogens), to improve growth (yield, quantity and quality of seeds, to provide earlier germination etc.) and/or to control insects (e.g. corn borers, Lepidoptera larvae etc.) The same results are provided by transgenic **plants** expressing (I).
Dwg.0/11

L18 ANSWER 20 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1997-051614 [05] WPIDS
DNN N1997-042476 DNC C1997-016992
TI Imparting pathogen resistance to **plants** - with hypersensitive response **elicitor polypeptide** or **protein**.
DC C05 C06 D16 P13
IN BEER, S V; WEI, Z
PA (CORR) CORNELL RES FOUND INC
CYC 71
PI WO 9639802 A1 19961219 (199705)* EN 69p
RW: AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG
W: AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN
AU 9659821 A 19961230 (199716)
US 5650387 A 19970722 (199735) 27p
FI 9704430 A 19980126 (199817)
US 5776889 A 19980707 (199834)
EP 871354 A1 19981021 (199846) EN
R: CH DE DK ES FR GB LI NL SE
BR 9609073 A 19990126 (199910)
US 5859324 A 19990112 (199910)
JP 11506938 W 19990622 (199935) 61p
NZ 309611 A 19990828 (199939)
AU 714512 B 20000106 (200013)
MX 9709781 A1 19981001 (200019)
KR 99022577 A 19990325 (200023)
CN 1192647 A 19980909 (200040)
ADT WO 9639802 A1 WO 1996-US8819 19960605; AU 9659821 A AU 1996-59821 19960605; US 5650387 A US 1995-475775 19950607; FI 9704430 A WO 1996-US8819 19960605, FI 1997-4430 19971205; US 5776889 A Cont of US 1995-475775 19950607, US 1997-891254 19970710; EP 871354 A1 EP 1996-917152 19960605, WO 1996-US8819 19960605; BR 9609073 A BR 1996-9073 19960605, WO 1996-US8819 19960605; US 5859324 A Div ex US 1995-475775 19950607, US 1997-819539 19970317; JP 11506938 W WO 1996-US8819 19960605, JP 1997-501304 19960605; NZ 309611 A NZ 1996-309611 19960605, WO 1996-US8819 19960605; AU 714512 B AU 1996-59821 19960605; MX 9709781 A1 MX 1997-9781 19971205; KR 99022577 A WO 1996-US8819 19960605, KR 1997-709058 19971206; CN 1192647 A CN 1996-196146 19960605
FDT AU 9659821 A Based on WO 9639802; EP 871354 A1 Based on WO 9639802; BR 9609073 A Based on WO 9639802; JP 11506938 W Based on WO 9639802; NZ 309611 A Based on WO 9639802; AU 714512 B Previous Publ. AU 9659821, Based on WO 9639802; KR 99022577 A Based on WO 9639802
PRAI US 1995-475775 19950607; US 1997-891254 19970710; US 1997-819539

19970317
AB WO 9639802 A UPAB: 19970129
A novel method of imparting pathogen resistance to **plants** comprises applying a hypersensitive response **elicitor polypeptide** or **protein** in a non-infectious form to a **plant** under conditions where the **polypeptide** or **protein** contacts cells of the **plant**.
Also claimed is a pathogen-resistant **plant** with cells in contact with [a] non-infectious hypersensitive response **elicitor polypeptide** or **protein**.
USE - The method may be used for imparting resistance to viruses, bacteria or fungi to crops and ornamental **plants**.
Dwg.0/2

L18 ANSWER 21 OF 21 WPIDS (C) 2003 THOMSON DERWENT
AN 1994-035054 [04] WPIDS
DNN N1994-027232 DNC C1994-016226
TI Hypersensitive response **elicitor protein** derived from **erwinia** amylovora - and DNA encoding it, useful for developing harpin inhibitors to prevent e.g. fire blight of fruit.
DC C06 D16 P13
IN BAUER, D W; BEER, S V; COLLMER, A; HE, S; LABY, R; WEI, Z
PA (CORR) CORNELL RES FOUND INC
CYC 19
PI WO 9401546 A1 19940120 (199404)* EN 47p
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: JP
EP 648266 A1 19950419 (199520) EN
R: AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
JP 07509604 W 19951026 (199551) 14p
EP 648266 A4 19950705 (199617)
US 5849868 A 19981215 (199906)
US 6174717 B1 20010116 (200106)
ADT WO 9401546 A1 WO 1993-US6243 19930630; EP 648266 A1 EP 1993-918140 19930630, WO 1993-US6243 19930630; JP 07509604 W WO 1993-US6243 19930630, JP 1994-503402 19930630; EP 648266 A4 EP 1993-918140 ; US 5849868 A Cont of US 1992-907935 19920701, US 1994-200724 19940223; US 6174717 B1 Cont of US 1992-907935 19920701, Div ex US 1994-200724 19940223, US 1997-851376 19970505
FDT EP 648266 A1 Based on WO 9401546; JP 07509604 W Based on WO 9401546; US 6174717 B1 Div ex US 5849868
PRAI US 1992-907935 19920701; US 1994-200724 19940223; US 1997-851376 19970505
AB WO 9401546 A UPAB: 19940613
The following are claimed: (A) E. Coli DHSalpha(pCPP103power4) ATCC 69021; (B) an isolated **peptide** (I), which, when applied to the surface or internal tissues of a **plant** is capable of eliciting a hypersensitive response (HR) in the **plant**; (C) a biologically active **peptide** having the 385 amino acid (AA) sequence given in the specification or derivs. with more than 1 AA addition, deletion, substitution, and/or insertion, with the provision that the specified changes do not inhibit the biological activity of the 385 amino acid sequence; (D) a method to alter the disease or hypersensitive response in a **plant** which comprises providing the **plant** with an inhibitor of the harpin **elicitor** (i.e. the hypersensitive response **elicitor** from **Erwinia** amylovora) and allowing the inhibitor to react with the harpin **elicitor**; and (E) a gene for insertion into an appropriate host to allow for the expression of harpin comprising a 1158 bp. nucleic acid sequence (given in full in the specification); and derivs. having more than 7 nucleic acid addition

deletion, substitution, and/or insertion (provided expression of harpin is not inhibited), in combination with a vector, for the insertion of the sequence into the host.

USE - Harpin is the name proposed for the hypersensitive response (HR) **elicitor** from E. amylovora, the bacterium which causes fire blight of apples, pears and other rosaceous **plants**. This **elicitor** is considered to be the archetype for a family of proteinaceous HR **elicitors** that are produced by many different phytopathogenic bacteria. Isolation of the harpin **polypeptide** and knowledge of its genetic coding sequence will allow harpin to be further characterised so that techniques to inactivate, destroy or bind harpin could be developed. For example, anti-harpin antibodies could be generated to neutralise toxic effects on **plants**. The gene sequence can also be used to identify homologous genes from **Erwinia**, **Xanthomonas** and **Pseudomonas** spp that encode HR **elicitors**.

Dwg.0/2

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FILE LAST UPDATED: 26 Jan 2003  (20030126/ED)

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substance identification.

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     (FILE 'WPIDS' ENTERED AT 11:58:23 ON 27 JAN 2003)
               DEL HIS Y

     FILE 'HCAPLUS' ENTERED AT 12:00:52 ON 27 JAN 2003
L1           366 S ELICITOR? (L) (PROTEIN# OR PEPTIDE# OR POLYPEPTIDE#)
L2        501700 S PLANT#
L3           238 S L1 AND L2
L4          5022 S DESSICCAT? OR DESICCAT? OR LONGEV?
L5         16617 S (DESSICCAT? OR DESICCAT? OR LONGEV?)/AB
L6             4 S L3 AND (L4 OR L5)
L7         58370 S CLAVIBACTER OR ERWINIA OR PHYTOPHTHORA OR PSEUDOMONAS OR RALS
L9            76 S L7 AND L3 AND L2
L10            0 S L9 AND ( HARVEST?)
L11            2 S L9 AND ( HARVEST?)/AB
L12         2898 S POSTHARVEST? OR POSTHARVEST?/AB
L13            1 S L9 AND L12
L14            4 S L6 OR L11 OR L13
L15        32777 S TRANSGEN?
L16           12 S L9 AND L15
L17            2 S CUTTING# AND L9
L18            4 S L17 OR L14
L19            9 S L16 NOT L18

     FILE 'HCAPLUS' ENTERED AT 12:07:08 ON 27 JAN 2003

=> d .ca l18 1-4;d .cal19 1-9

L18  ANSWER 1 OF 4  HCAPLUS  COPYRIGHT 2003 ACS
ACCESSION NUMBER:         2002:368228  HCAPLUS
DOCUMENT NUMBER:          136:365289
TITLE:                    Inhibition of desiccation of
                          cuttings removed from ornamental
                          plants by hypersensitive response
```

elicitor protein or
polypeptide

INVENTOR(S): Wei, Zhong-Min; Leon, Ernesto; Oviedo, Agustin
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 69 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002037960	A2	20020516	WO 2001-US43715	20011106
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002036469	A5	20020521	AU 2002-36469	20011106

PRIORITY APPLN. INFO.: US 2000-248169P P 20001113
WO 2001-US43715 W 20011106

AB **Desiccation** of cuttings removed from ornamental plants is inhibited by treating the cutting with a hypersensitive response elicitor protein or polypeptide derived from plant pathogen. The ornamental plants can be transgenic plants which express a heterologous hypersensitive response elicitor protein or polypeptide or the ornamental plants can be treated via topical application with a hypersensitive response elicitor protein or polypeptide. Alternatively, cuttings from the ornamental plant can be treated with a hypersensitive response elicitor protein or polypeptide, independent of any treatment provided to the ornamental plant from which the cutting is removed.

IC ICM A01N
CC 5-3 (Agrochemical Bioregulators)
ST **plant** ornamental **desiccation** inhibitor **elicitor protein polypeptide**

IT Liliopsida
Magnoliopsida
(inhibition of **desiccation** by hypersensitive response elicitor of **cuttings** removed from)

IT Drying
Flower
Leaf
Stem
(inhibition of **desiccation** of **cuttings** removed from ornamental **plants** by hypersensitive response elicitor)

IT **Peptides**, biological studies
Proteins
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(inhibition of **desiccation** of **cuttings** removed from ornamental **plants** by hypersensitive response **elicitor**)

IT **Clavibacter**
Erwinia
Phytophthora

Plant pathogen
Pseudomonas
Ralstonia
Xanthomonas
(inhibition of **desiccation** of **cuttings** removed from ornamental **plants** by hypersensitive response elicitor from)

IT Transformation, genetic
(inhibition of **desiccation** of **cuttings** removed from transgenic ornamental **plants** expressing hypersensitive response elicitor)

IT Embryophyta
(ornamental **plant**; inhibition of **desiccation** by hypersensitive response elicitor of **cuttings** removed from)

IT Hormones, microbial
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(phytoalexin-eliciting; inhibition of **desiccation** of **cuttings** removed from ornamental **plants** by)

IT Embryophyta
(transgenic; inhibition of **desiccation** by hypersensitive response elicitor of **cuttings** removed from)

L18 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2002:123055 HCAPLUS
DOCUMENT NUMBER: 136:179298
TITLE: Polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses
INVENTOR(S): Wei, Zhong-Min; Swanson, Shane S.
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002012293	A2	20020214	WO 2001-US23787	20010727
WO 2002012293	A3	20020808		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 2002066122	A1	20020530	US 2001-829124	20010409
AU 2001078063	A5	20020218	AU 2001-78063	20010727

PRIORITY APPLN. INFO.:
US 2000-224053P P 20000809
US 2001-829124 A 20010409
US 1998-103124P P 19981005
US 1999-412452 B2 19991004
WO 2001-US23787 W 20010727

AB The present invention is directed to an isolated DNA mol. encoding a Xanthomonas hypersensitive response elicitor protein or polypeptide. The DNA mol. and its encoded hypersensitive response elicitor protein or

polypeptide have the following uses: imparting disease resistance to plants, enhancing plant growth, controlling insects on plants, imparting stress resistance, imparting post-**harvest** disease resistance, maximizing the benefit of or overcoming a yield penalty assocd. with a transgenic trait, inhibiting **desiccation** of cuttings from ornamental plants, promoting early flowering of an ornamental plant, and **harvesting** cuttings from ornamental plants. These can be achieved by applying the hypersensitive response elicitor in a non-infectious form to plants or plant seeds (or cuttings or fruits or vegetables **harvested** from such plants) or by expression of the hypersensitive response elicitor in transgenic plants. Expression vectors, host cells transgenic plants, transgenic plant cuttings, and transgenic plant seeds are also disclosed. Genomic DNA encoding the hypersensitive response elicitor protein from Xanthomonas campestris pelargonii was cloned and the recombinantly expressed protein was active in tobacco. Results of Southern blot hybridizations with a gene hreX probe suggest that the gene is present in many Xanthomonas species.

IC ICM C07K014-195

CC 5-2 (Agrochemical Bioregulators)
Section cross-reference(s): 3, 4, 6, 11

ST DNA sequence **Xanthomonas** gene hreX hypersensitive response **elicitor protein**; transgenic **plant** recombinant gene hreX **protein** disease resistance horticulture

IT **Proteins**
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(ACC degrdn., transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Toxins
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(B.t., transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT **Proteins**
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(Photorhabdus luminescens, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Insecticides
(biol.; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Flower
(color, transgenes for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Growth and development, **plant**
(flowering, early; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT **Proteins**
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(herbicide resistance, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Gene, microbial

RL: AGR (Agricultural use); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(hreX; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Reproduction, **plant**
(male sterility, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT DNA sequences
(of gene hreX isolated from **Xanthomonas** campestris pelargonii)

IT **Protein** sequences
(of hypersensitive response **elicitor protein** isolated from **Xanthomonas** campestris pelargonii)

IT Embryophyta
(ornamental **plant**; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT **Proteins**
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(osmotins, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Plasmid vectors
(pE172; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Hormones, microbial
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); USES (Uses)
(phytoalexin-eliciting; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Food
(**plant** products, biochem. modified, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Disease resistance, **plant**
Genetic engineering
Herbicide resistance
Molecular cloning
Regeneration, **plant**
Xanthomonas
Xanthomonas campestris pelargonii
(polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT cDNA
RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)
(polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Antisense RNA
RNA
RL: AGR (Agricultural use); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Probes (nucleic acid)

RL: ARG (Analytical reagent use); BUU (Biological use, unclassified); PRP (Properties); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Fruit
Vegetable
(preservation; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Transformation, genetic
(recombinant host; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Tobacco mosaic virus
(resistance to; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Bacteria (Eubacteria)
Embryophyta
(transformed; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Agglutinins and Lectins
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Fructooligosaccharides
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(transgenes for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Alfalfa (Medicago sativa)
Apple
Arabidopsis thaliana
Barley
Bean (Phaseolus vulgaris)
Beet
Broccoli
Brussels sprout
Cabbage
Canola
Capsicum
Carnation (Dianthus)
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Chrysanthemum
Citrus
Corn
Cotton
Cranberry
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)

Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Parsnip
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pelargonium
Pepper (Piper)
Petunia
Pineapple (Ananas comosus)
Poinsettia
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rose (Rosa)
Rye
Saintpaulia
Seed
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Tulip
Turnip
Wheat
Zinnia
(transgenic; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT **Proteins**
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(viral, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Stress, **plant**
(water deficiency, resistance to **desiccation**; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT **Plant** tissue
(wound, **cutting**, resistance to **desiccation**; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT Toxins
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(.delta.-endotoxins, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT 398585-12-1P

RL: AGR (Agricultural use); BPN (Biosynthetic preparation); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); USES (Uses)
(amino acid sequence; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT 9000-92-4P, Amylase
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(inhibitor, transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT 398585-11-0 398585-13-2
RL: AGR (Agricultural use); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT 9001-06-3P, Chitinase 9001-57-4P, Invertase 9001-65-4P, Mannitol dehydrogenase 9012-33-3P, Chitobiase 9026-12-4P, Barnase 37205-61-1P, Protease inhibitor 37341-58-5P, Phytase 103220-14-0P, Defensin
RL: AGR (Agricultural use); BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation); USES (Uses)
(transgene for; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

IT 398593-40-3 398593-41-4 398593-42-5
RL: PRP (Properties)
(unclaimed nucleotide sequence; polynucleotides and **polypeptides** for hypersensitive response **elicitor** from **Xanthomonas** campestris, and their uses)

L18 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2001:797991 HCAPLUS
DOCUMENT NUMBER: 135:299956
TITLE: Treatment of fruits or vegetables with hypersensitive response elicitor to inhibit **postharvest** disease or **desiccation**
INVENTOR(S): Wei, Zhong-Min; Qiu, Dewen; Remick, Dean
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 72 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001080639	A2	20011101	WO 2001-US12468	20010417
WO 2001080639	A3	20020221		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,

BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
US 2002019337 A1 20020214 US 2001-835684 20010416
EP 1274307 A2 20030115 EP 2001-927112 20010417
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
PRIORITY APPLN. INFO.: US 2000-198359P P 20000419
WO 2001-US12468 W 20010417

AB A method of inhibiting **postharvest** disease or **desiccation** in a fruit or vegetable consists of either by treating a fruit or vegetable with a hypersensitive response elicitor protein or polypeptide under conditions effective to inhibit **postharvest** disease or **desiccation**, or by providing a transgenic plant or plant seed transformed with a DNA mol. encoding a hypersensitive response elicitor polypeptide or protein and growing the transgenic plant or transgenic plant produced from the transgenic plant seed under conditions effective to inhibit a **postharvest** disease or **desiccation** in a fruit or vegetable **harvested** from the transgenic plant. Also disclosed are DNA constructs and expression systems, host cells, and transgenic plants contg. the DNA construct.

IC ICM A01N037-46
ICS A01N063-00; A01N063-02
CC 5-2 (Agrochemical Bioregulators)
Section cross-reference(s): 17
ST **protein polypeptide elicitor** fruit vegetable **postharvest** disease **desiccation** inhibitor

IT Agrobacterium
(cell; encoding hypersensitive response **elicitor protein** or **peptide** inhibiting fruits or vegetables **postharvest** disease or **desiccation**)

IT **Plant** cell
(encoding hypersensitive response **elicitor protein** or **peptide** inhibiting fruits or vegetables **postharvest** disease or **desiccation**)

IT DNA
RL: AGR (Agricultural use); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(encoding hypersensitive response **elicitor protein** or **peptide** inhibiting **postharvest** fruits or vegetables disease or **desiccation**)

IT **Peptides**, biological studies
Proteins, specific or class
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(hypersensitive response **elicitors**; treatment of fruits or vegetables with hypersensitive response **elicitor** to inhibit **postharvest** disease or **desiccation**)

IT Hormones, microbial
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(phytoalexin-eliciting; treatment of fruits or vegetables with hypersensitive response elicitor to inhibit **postharvest** disease or **desiccation**)

IT Dicotyledon (Magnoliopsida)
Monocotyledon (Liliopsida)
Transformation, genetic
(transgenic **plant** encoding hypersensitive response **elicitor protein** or **peptide** inhibiting fruits or vegetables **postharvest** disease or

desiccation)
IT Fruit
Vegetable
(treatment of fruits or vegetables to inhibit **postharvest** disease or **desiccation** with hypersensitive response **elicitor protein**)
IT **Erwinia**
Erwinia amylovora
Pantoea stewartii stewartii
Pectobacterium carotovorum
Pectobacterium chrysanthemi
Phytophthora
Pseudomonas
Pseudomonas syringae
Ralstonia solanacearum
Xanthomonas
(treatment of fruits or vegetables to inhibit **postharvest** disease or **desiccation** with hypersensitive response **elicitor protein** derived from)
IT Botrytis
Penicillium
(treatment of fruits or vegetables with hypersensitive response **elicitor protein** against)
IT Disease, **plant**
Drying
(treatment of fruits or vegetables with hypersensitive response **elicitor protein** to inhibit **postharvest**)

L18 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 1995:383550 HCAPLUS
DOCUMENT NUMBER: 122:156399
TITLE: Changes in protein methylation associated with the elicitation response in cell cultures of alfalfa (Medicago sativa L.)
AUTHOR(S): Daniell, Timothy; Edwards, Robert
CORPORATE SOURCE: Department of Biological Sciences, University of Durham, Durham, DH1 3LE, UK
SOURCE: FEBS Letters (1995), 360(1), 57-61
CODEN: FEBLAL; ISSN: 0014-5793
PUBLISHER: Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The methylation of endogenous proteins increased in alfalfa cell suspension cultures following treatment with a fungal elicitor. Carboxyl methylation, a post-translational modification assocd. with controlling the localization and **longevity** of proteins, was the dominant form of protein methylation in both elicited and unelicited cells. Protein methylation was restricted to a limited no. of peptides prior to elicitor treatment but as elicitation progressed the no. of endogenous substrates increased. Increases resulted from a combination of an elicitor-dependent increase in the activity of a protein carboxyl methyltransferase and the accumulation of preferred endogenous substrates in the latter stages of elicitation.
CC 11-2 (Plant Biochemistry)
ST **protein** methylation alfalfa suspension culture **elicitor**
IT **Plant** tissue culture
(suspension, protein methylation assocd. with the elicitation response in cell cultures of alfalfa)

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'.CAL19' IS NOT A VALID FORMAT FOR FILE 'HCAPLUS'
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L19  ANSWER 1 OF 9  HCAPLUS  COPYRIGHT 2003 ACS
ACCESSION NUMBER:         2001:923552  HCAPLUS
DOCUMENT NUMBER:          136:51265
TITLE:                    Expression of a hypersensitive response elicitor gene
                          in combination with other transgenes in
                          plants to improve growth, stress tolerance,
                          disease or insect resistance
INVENTOR(S):              Wei, Zhong-Min; Derocher, Jay
PATENT ASSIGNEE(S):       Eden Bioscience Corporation, USA
SOURCE:                   PCT Int. Appl., 86 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
     WO 2001095724      A2   20011220      WO 2001-US18955  20010613
     WO 2001095724      A3   20020530
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
             HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
             LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
             SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU,
             ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
             DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,
             BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     US 2002059658      A1   20020516      US 2001-880371   20010613
PRIORITY APPLN. INFO.:                   US 2000-211585P  P  20000615
AB   The present invention relates to methods of improving the effectiveness of
     transgenic plants, either by maximizing the benefit of transgenic trait in
     transgenic plants or overcoming deleterious effects on growth, stress
     tolerance, disease resistance, or insect resistance in transgenic plants
     expressing a transgenic trait.  By applying a hypersensitive response
     elicitor protein or polypeptide to a transgenic plant expressing a
     transgene which confers a transgenic trait, or by prepg. a transgenic
     plant expressing both a transgene which confers a transgenic trait and a
     second transgene which confers hypersensitive response elicitor
     expression, it is possible to realize the max. benefit of the transgenic
     trait or overcome deleterious effects on growth, stress tolerance, disease
     or insect resistance, male sterility, modified flower color or biochem.
     modified plant products which result from or accompany expression of the
     transgene conferring the transgenic trait.  The hypersensitive response
     elicitor protein can be applied to the plant or seed at a concn. greater
     than 0.5 nM by spraying, injection, dusting, immersion or leaf abrasion in
     water, aq. solns., slurries or powder.
IC   ICM  A01N063-00
CC   11-4 (Plant Biochemistry)
     Section cross-reference(s): 3, 5
ST   hypersensitive response elicitor protein
     transgenic plants; growth stress tolerance disease
     insect resistance transgenic plants
```

IT Apple
Barley
Bean (Phaseolus vulgaris)
Broccoli
Cabbage
Canola
Capsicum
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Corn
Cotton
Cranberry
Cucumber (Cucumis sativus)
Disease resistance, **plant**
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)
Grape
Growth and development, **plant**
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pineapple (Ananas comosus)
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rye
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
(expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Herbicide resistance
(hypersensitive response **elicitor protein** in generating improved; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT **Clavibacter**
Erwinia
Phytophthora
Pseudomonas
Xanthomonas

(hypersensitive response **elicitor protein** of; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Embryophyta
(hypersensitive response **elicitor protein** synthesis in **transgenic**; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Seed
(hypersensitive response **elicitor protein** synthesis in; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT **Proteins**
RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(hypersensitive response **elicitor**; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Herbicides
(imidazolinone, resistance of **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT **Plant** virus
(improving **plant** resistance to; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Peptidoglycans
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(inhibitor synthesis in **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Flower
(modified color of; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Genetic engineering
(of **plant** growth and stress or disease tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT **Proteins**
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(osmotins, synthesis in improving **plant** stress tolerance; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Food
(**plant** products, biochem. modified, hypersensitive response **elicitor protein** in altering; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth,

stress tolerance, disease or insect resistance)

IT Spodoptera frugiperda
(**plant** resistance to; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Gene
(processes, sense suppression of gene causing adverse effects in **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Photorhabdus luminescens
(**protein** in improving **plant** stress tolerance of; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Nematoda
(reniform, **plant** resistance to; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Sulfonylureas
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(resistance of **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Reproduction, **plant**
(sterility, male, reversed by hypersensitive response **elicitor protein**; expression of hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Agglutinins and Lectins
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(synthesis in improving **plant** stress tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Antisense DNA
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(to gene causing adverse effects in **transgenic plants** ; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Stress, **plant**
(tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Verticillium
(wilt, **plant** resistance to; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT Toxins
RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)
(.delta.-endotoxins, synthesis in **transgenic plants**

; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 151438-54-9, Messenger
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(Messenger, **transgenic plants** treated with; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 22059-21-8, Acc
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(enzymes degrading, synthesis in **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 37205-61-1, Protease inhibitor
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(in improving **plant** stress tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 9000-92-4, Amylase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(inhibitors, in improving **plant** stress tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 1071-83-6, Glyphosate 1689-84-5, Bromoxynil 51276-47-2, Glufosinate 74051-80-2, Sethoxydim 160759-37-5, Synchrony
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(resistance of **transgenic plants**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 9001-06-3, Endochitinase 9012-33-3, Chitobiase 103220-14-0, Defensin
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(synthesis in improving **plant** stress tolerance; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 9001-57-4, Invertase 9001-65-4, Mannitol dehydrogenase 9026-12-4, Barnase 9037-90-5, Fructan 37288-62-3, S-Adenosylmethionine hydrolase 37341-58-5, Phytase
RL: AGR (Agricultural use); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(synthesis in **transgenic plant**; expression of hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 382669-12-7, 2: PN: WO0195724 SEQID: 2 unclaimed DNA 382669-14-9, 4: PN: WO0195724 SEQID: 4 unclaimed DNA 382669-16-1, 6: PN: WO0195724 SEQID: 6 unclaimed DNA 382669-18-3, 8: PN: WO0195724 SEQID: 8 unclaimed DNA 382669-20-7 382669-22-9 382669-24-1
RL: PRP (Properties)

(unclaimed nucleotide sequence; expression of a hypersensitive response elicitor gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

IT 382669-11-6 382669-13-8 382669-15-0 382669-17-2 382669-19-4
382669-21-8 382669-23-0 382669-25-2
RL: PRP (Properties)
(unclaimed **protein** sequence; expression of a hypersensitive response **elicitor** gene in combination with other **transgenes** in **plants** to improve growth, stress tolerance, disease or insect resistance)

L19 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2001:713571 HCAPLUS
DOCUMENT NUMBER: 135:269069
TITLE: **Plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance
INVENTOR(S): Song, Xiaoling; Fan, Hao; Wei, Zhong-Min
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 78 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001070988	A2	20010927	WO 2001-US8728	20010319
WO 2001070988	A3	20020404		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 2002007501	A1	20020117	US 2001-810997	20010316
EP 1268805	A2	20030102	EP 2001-920516	20010319
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				

PRIORITY APPLN. INFO.: US 2000-191649P P 20000323
US 2000-250710P P 20001201
WO 2001-US8728 W 20010319

AB The present invention is directed to an isolated protein which serves as a receptor in plants for a plant pathogen hypersensitive response elicitor. Also disclosed are nucleic acid mols. encoding such receptors as well as expression vectors, host cells, transgenic plants, and transgenic plant seeds contg. such nucleic acid mols. Both the protein and nucleic acid can be used to identify agents targeting plant cells to enhance a plant's receptivity to treatment with a hypersensitive response elicitor and to directly impart plant growth enhancement as well as resistance against disease, insects, and stress. Thus, the Arabidopsis thaliana cDNA and gene for Erwinia amylovora harpin-binding protein HrBP1 were cloned and sequenced. A partial cDNA for the rice HrBP1 homolog was also cloned and sequenced. HrBP1 was found everywhere is the A. thaliana plant. HrBP1 mRNA was found in many different plants (monocots as well as dicots).

Silencing of HrBP1 expression in A. thaliana enhanced its resistance to Pseudomonas syringae p.v. tomato infection. Overexpression of HrBP1 in tobacco resulted in enhanced resistance to tobacco mosaic virus.

IC ICM C12N015-29
ICS C12N015-82; C12N015-11; C12N001-21; C12N005-10; A01H005-00; G01N033-68; A01N065-00; A01N063-00

CC 6-3 (General Biochemistry)
Section cross-reference(s): 3, 11

ST sequence Arabidopsis rice harpin binding protein HrBP1 cDNA; disease stress insect resistance **transgenic plant** harpin binding protein

IT Nucleic acids
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study); USES (Uses)
(antisense; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT Bacteria (Eubacteria)
Plant cell
(harpin-binding protein gene-expressing; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT Genetic vectors
(harpin-binding protein-encoding; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT **Clavibacter**
Erwinia
Erwinia amylovora
Phytophthora
Pseudomonas
Xanthomonas
(hypersensitive response **elicitors** of, receptor for; **plant** harpin-binding **protein** and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT Disease resistance, **plant**
Growth and development, **plant**
Insect (Insecta)
Stress, **plant**
(**plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT Arabidopsis thaliana
Dicotyledon (Magnoliopsida)
Monocotyledon (Liliopsida)
Rice (Oryza sativa)
(**plant** pathogen hypersensitive response **elicitor** receptor of; **plant** harpin-binding **protein** and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT Alfalfa (Medicago sativa)
Apple
Barley
Bean (Phaseolus vulgaris)
Beet
Broccoli
Brussels sprout
Cabbage

Capsicum
Carnation (Dianthus)
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Chrysanthemum
Citrus
Corn
Cotton
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)
Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Parsnip
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pelargonium
Petunia
Pineapple (Ananas comosus)
Plant (Embryophyta)
Poinsettia
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rye
Saintpaulia
Seed
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
Zinnia
(**transgenic**, harpin-binding protein DNA-expressing; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT 282748-10-1 363238-53-3
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence)
(amino acid sequence; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT 362457-08-7 362457-09-8 362457-10-1 362457-12-3
RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; **plant** harpin-binding protein and cDNA

and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT 362457-11-2, 8: PN: WO0170988 SEQID: 8 unclaimed DNA
RL: PRP (Properties)
(unclaimed nucleotide sequence; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT 363240-03-3
RL: PRP (Properties)
(unclaimed protein sequence; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

IT 208755-87-7
RL: PRP (Properties)
(unclaimed sequence; **plant** harpin-binding protein and cDNA and **transgenic plants** with enhanced growth and insect, disease and stress resistance)

L19 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2001:565226 HCAPLUS
DOCUMENT NUMBER: 135:148226
TITLE: Oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of a heterologous hypersensitive response elicitor
INVENTOR(S): Beer, Steven V.; Bauer, David W.
PATENT ASSIGNEE(S): Cornell Research Foundation, Inc., USA
SOURCE: PCT Int. Appl., 73 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001055347	A1	20010802	WO 2001-US2579	20010126
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 2002069434	A1	20020606	US 2001-770693	20010126

PRIORITY APPLN. INFO.: US 2000-178565P P 20000126

AB The present invention relates to a chimeric gene that includes a first DNA mol. encoding a hypersensitive response elicitor protein or polypeptide, a promoter operably linked 5' to the first DNA mol. to induce transcription of the first DNA mol. in response to activation of the promoter by an oomycete, and a 3' regulatory region operably linked to the first DNA mol. Also disclosed are an expression system and a host cell contg. the chimeric gene. The present invention also relates to a transgenic plant resistant to disease resulting from oomycete infection, the transgenic plant including the chimeric gene, wherein the promoter induces transcription of the first DNA mol. in response to infection of the plant by an oomycete. Transgenic seeds and transgenic cultivars obtained from the transgenic plant are also disclosed. Addnl. aspects of the present invention include methods of making a recombinant plant cell and a

transgenic plant.
IC ICM C12N005-04
ICS C12N015-09; C12N015-29; C12N015-31; C12N015-82; A01H005-00
CC 3-2 (Biochemical Genetics)
Section cross-reference(s): 11
ST **transgenic** disease resistant **plant**; harpin signal peptide promoter DNA sequence
IT Reporter gene
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(GUS; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Gene, **plant**
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
(chimeric; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Disease, **plant**
(fungal; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Promoter (genetic element)
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
(gst1; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Gene, microbial
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
(hrpN; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Stress, **plant**
(infection; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)
IT Agrobacterium
Agrobacterium tumefaciens
Arabidopsis thaliana
DNA sequences
Disease resistance, **plant**
Genetic engineering
Protein sequences
Tobacco (Nicotiana tabacum samsun)
(oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response **elicitor**)
IT Signal **peptides**
Transgene
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
(oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response **elicitor**)
IT Chimeric gene
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)

(**plant**; oomycete-resistant **transgenic** **plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT **Clavibacter**
Erwinia
Erwinia amylovora
Pantoea stewartii stewartii
Pectobacterium carotovorum
Pectobacterium chrysanthemi
Phytophthora
Pseudomonas
Pseudomonas syringae syringae
Ralstonia solanacearum
Xanthomonas
(target hrpN donor; oomycete-resistant **transgenic** **plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT Apple
Barley
Bean (Phaseolus vulgaris)
Broccoli
Cabbage
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Corn
Cotton
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)
Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pepper (Piper)
Pineapple (Ananas comosus)
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rye
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
(target **transgenic** **plants**; oomycete-resistant

transgenic plants by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT Albugo
Aphanomyces
Bremia
Peronospora
Peronospora tabacina
Phytophthora nicotianae
Plasmopara
Plasmopara viticola
Pseudoperonospora
Pythium
Sclerospora
(targeted pathogens; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT 151217-41-3, **Protein** harpinPss (**Pseudomonas** syringae syringae clone pSYHJ0 gene hrpZ) 155979-23-0 186711-41-1 208997-00-6 247158-77-6 352204-76-3 352321-69-8 352322-32-8
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(amino acid sequence; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response **elicitor**)

IT 140270-48-0 186711-42-2 186711-43-3 208997-01-7 222646-98-2 352507-98-3 352507-99-4
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(nucleotide sequence; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT 151438-54-9, Harpin
RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
(oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT 132051-12-8, genbank x06361 141011-59-8, genbank x58546
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of heterologous hypersensitive response elicitor)

IT 352508-31-7 352508-33-9 352508-34-0 352508-35-1 352508-36-2 352508-37-3 352508-38-4
RL: PRP (Properties)
(unclaimed nucleotide sequence; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of a heterologous hypersensitive response elicitor)

IT 352508-30-6 352508-32-8
RL: PRP (Properties)
(unclaimed **protein** sequence; oomycete-resistant **transgenic plants** by virtue of pathogen-induced expression of a heterologous hypersensitive response **elicitor**)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2000:335576 HCAPLUS

DOCUMENT NUMBER: 133:1481
TITLE: Methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens
INVENTOR(S): Wei, Zhong-Min; Schading, Richard L.
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 84 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000028055	A2	20000518	WO 1999-US26039	19991104
WO 2000028055	A3	20000914		
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1124974	A2	20010822	EP 1999-958773	19991104
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002529095	T2	20020910	JP 2000-581221	19991104

PRIORITY APPLN. INFO.: US 1998-107243P P 19981105
WO 1999-US26039 W 19991104

AB The present invention is directed to imparting stress resistance to plants. This can be achieved by applying a hypersensitive response elicitor protein to plants or plant seeds under conditions effective to impart stress resistance to plants or plants grown from the plant seeds. Alternatively, transgenic plants or plant seeds transformed with a DNA mol. encoding the elicitor can be provided and the transgenic plants or plants resulting from the transgenic plant seeds are grown under conditions effective to impart stress resistance to plants or plants grown from the plant seeds. The response elicitor proteins of the invention were derived from Erwinia, Pseudomonas, and Xanthomonas and were used to combat insecticide stress in cotton, drought stress in cucumber, herbicide stress in pepper, and calcium deficiency in tomato.

IC ICM C12N015-82
ICS C12N015-31; A01N063-02
CC 3-2 (Biochemical Genetics)
Section cross-reference(s): 1, 5, 6, 10, 11
ST genetic engineering **plant** stress hypersensitive response **elicitor protein**
IT Nutrition, **plant**
(calcium, deficiency; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)
IT Air pollution
(carbon dioxide, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)
IT Stress, **plant**

(chem.; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(cold; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(environmental; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(frost; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(heat; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Environmental pollution
(heavy metal, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Environmental pollution
(hydrocarbon, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT **Clavibacter**
Clavibacter michiganense
Pantoea stewartii stewartii
Pectobacterium carotovorum
Phytophthora
(hypersensitive response **elicitor** derived from; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT **Proteins**, specific or class
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); BIOL (Biological study); PREP (Preparation); USES (Uses)
(hypersensitive response **elicitor**; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(light deficiency; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(light excess; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Nutrients
(macronutrients, resistance to nutritional stress caused by; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT **Erwinia** amylovora
Fungicide resistance
Genetic engineering

Herbicide resistance
Insecticide resistance
Pectobacterium chrysanthemi
Pseudomonas syringae
Ralstonia solanacearum
Stress, **plant**
Xanthomonas campestris glycines
Xanthomonas campestris pelargonii
(methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Nutrients
(micronutrients, resistance to nutritional stress caused by; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Environmental pollution
(nitrogen oxide, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(nutrient deficiency; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Environmental pollution
(ozone, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT UV radiation
(resistance to excesses of; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Fertilizers
RL: ADV (Adverse effect, including toxicity); BIOL (Biological study)
(resistance to nutritional stress caused by; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Acid rain
(resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Air pollution
(sulfur dioxide, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Alfalfa (Medicago sativa)
Apple
Arabidopsis thaliana
Barley
Beet
Broccoli
Brussels sprout
Cabbage
Capsicum
Carnation (Dianthus)
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)

Chrysanthemum
Citrus
Corn
Cotton
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)
Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Parsnip
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pelargonium
Petunia
Pineapple (Ananas comosus)
Plant (Embryophyta)
Poinsettia
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rye
Saintpaulia
Seed
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
Zinnia
(**transgenic**/treated; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(water deficiency; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT Stress, **plant**
(water; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT 630-08-0, CARBON monoxide, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(pollution, resistance to; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT 186711-42-2 186711-43-3 208997-01-7 215916-78-2 220672-59-3
220672-72-0 220672-77-5 222646-98-2

RL: PRP (Properties)
(unclaimed nucleotide sequence; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT 151217-41-3, **Protein** harpinPss (**Pseudomonas** syringae syringae clone pSYH10 gene hrpZ) 155979-23-0 186711-41-1 201366-40-7 201366-41-8 208293-02-1 208997-00-6 215797-46-9
RL: PRP (Properties)
(unclaimed **protein** sequence; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

IT 208755-87-7 208755-88-8
RL: PRP (Properties)
(unclaimed sequence; methods of imparting stress resistance to **plants** with hypersensitive response **elicitor proteins** derived from fungal and bacterial pathogens)

L19 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 2000:241283 HCAPLUS
DOCUMENT NUMBER: 132:275186
TITLE: Sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit a hypersensitive response, and their applications in **plant** genetic engineering
INVENTOR(S): Wei, Zhong-Min; Fan, Hao; Niggemeyer, Jennifer L.
PATENT ASSIGNEE(S): Eden Bioscience Corporation, USA
SOURCE: PCT Int. Appl., 100 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000020452	A2	20000413	WO 1999-US23181	19991005
WO 2000020452	A3	20000706		
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2344593	AA	20000413	CA 1999-2344593	19991005
AU 9965085	A1	20000426	AU 1999-65085	19991005
BR 9915345	A	20010731	BR 1999-15345	19991005
EP 1119582	A2	20010801	EP 1999-953057	19991005
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002526101	T2	20020820	JP 2000-574563	19991005
NO 2001001729	A	20010605	NO 2001-1729	20010405

PRIORITY APPLN. INFO.: US 1998-103050P P 19981005
WO 1999-US23181 W 19991005

AB The invention provides sequences encoding active fragments of a hypersensitive response elicitor protein which does not elicit a

hypersensitive response in plants. Specifically, the fragments are derived from hypersensitive response elicitor proteins from Erwinia amylovora (gene hrpN) and/or Pseudomonas syringae (gene hrpZ). Isolated fragments of hypersensitive response elicitor proteins have the following activities: imparting disease resistance to plants, enhancing plant growth, and/or controlling insects on plants. This can be achieved by applying the fragments of a hypersensitive response elicitor in a non-infectious form to plants or plant seeds, or by using transgenic plants or plant seeds transformed with a DNA mol. encoding the hypersensitive response elicitor fragment.

IC ICM C07K014-195
ICS C12N015-31; C12N001-21; C12N005-10; A01H005-00; A01H005-10; C12N015-82

CC 3-3 (Biochemical Genetics)
Section cross-reference(s): 6, 10, 11

ST sequence hypersensitive response **elicitor protein** fragment **Pseudomonas Erwinia; plant** insect disease growth hypersensitive response **elicitor protein** fragment

IT Insect (Insecta)
(control; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT Growth and development, **plant**
(enhancement; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT **Proteins**, specific or class
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation); USES (Uses)
(harpin; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT Gene, microbial
RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)
(hrp, hrpN (**Erwinia** amylovora); sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT Gene, microbial
RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)
(hrp, hrpZ (**Pseudomonas** syringae); sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT Tobacco mosaic virus
(**plants** resistant to; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their

applications in **plant** genetic engineering)
IT Disease, **plant**
(resistance; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)
IT Alfalfa (Medicago sativa)
Apple
Arabidopsis thaliana
Barley
Bean (Phaseolus vulgaris)
Beet
Broccoli
Brussels sprout
Cabbage
Capsicum
Carnation (Dianthus)
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Chrysanthemum
Citrus
Corn
Cotton
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Erwinia
Erwinia amylovora
Garlic (Allium sativum)
Genetic vectors
Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Molecular cloning
Onion (Allium cepa)
Parsnip
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pelargonium
Petunia
Phytophthora
Pineapple (Ananas comosus)
Poinsettia
Potato (Solanum tuberosum)
Protein sequences
Pseudomonas
Pseudomonas syringae
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rye
Saintpaulia
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)

Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
Xanthomonas
Zinnia
cDNA sequences
(sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT Seed
(**transgenic plant** seed; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT **Plant** (Embryophyta)
(**transgenic**; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT 151217-41-3DP, **Protein** harpinPss (**Pseudomonas** syringae syringae clone pSYH10 gene hrpZ), subfragments are claimed 208997-00-6DP, subfragments are claimed 263749-47-9P 263749-48-0P 263749-49-1P 263884-99-7P 263885-00-3P 263885-01-4P 263885-02-5P 263885-03-6P 263901-65-1P
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation); USES (Uses)
(amino acid sequence; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit hypersensitive response, and their applications in **plant** genetic engineering)

IT 186711-43-3 208997-01-7 215916-78-2 220672-59-3 220672-72-0 220672-77-5 222646-98-2 263885-44-5, 1: PN: WO0020452 SEQID: 1 unclaimed DNA 263885-45-6, 2: PN: WO0020452 SEQID: 2 unclaimed DNA 263885-46-7, 3: PN: WO0020452 SEQID: 3 unclaimed DNA 263885-47-8, 4: PN: WO0020452 SEQID: 4 unclaimed DNA 263885-48-9, 5: PN: WO0020452 SEQID: 5 unclaimed DNA 263885-49-0, 6: PN: WO0020452 SEQID: 6 unclaimed DNA 263885-50-3, 7: PN: WO0020452 SEQID: 7 unclaimed DNA 263885-51-4, 8: PN: WO0020452 SEQID: 8 unclaimed DNA 263885-52-5, 9: PN: WO0020452 SEQID: 9 unclaimed DNA 263885-53-6 263885-54-7 263885-55-8 263885-56-9 263885-57-0 263885-58-1 263885-59-2 263885-60-5 263885-61-6 263885-62-7 263885-63-8 263885-64-9
RL: PRP (Properties)
(unclaimed nucleotide sequence; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit a hypersensitive response, and their applications in **plant** genetic engineering)

IT 155979-23-0 186711-41-1 201366-40-7 201366-41-8 208293-02-1 215797-46-9
RL: PRP (Properties)
(unclaimed **protein** sequence; sequences encoding fragments of microbial hypersensitive response **elicitor proteins**

which are active but do not elicit a hypersensitive response, and their applications in **plant** genetic engineering)

IT 157849-44-0 208755-87-7 208755-88-8
RL: PRP (Properties)
(unclaimed sequence; sequences encoding fragments of microbial hypersensitive response **elicitor proteins** which are active but do not elicit a hypersensitive response, and their applications in **plant** genetic engineering)

L19 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 1999:3333 HCAPLUS
DOCUMENT NUMBER: 130:78798
TITLE: Hypersensitive response elicitor from **Erwinia** chrysanthemi
INVENTOR(S): Bauer, David; Collmer, Alan
PATENT ASSIGNEE(S): Cornell Research Foundation, Inc., USA
SOURCE: U.S., 27 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5850015	A	19981215	US 1995-484358	19950607
US 6001959	A	19991214	US 1998-118959	19980717

PRIORITY APPLN. INFO.: US 1995-484358 19950607

AB The present invention relates to an isolated protein or polypeptide corresponding to a protein or polypeptide in Erwinia chrysanthemi which elicits a hypersensitive response in plants. The encoding DNA mol. alone in isolated form or either in an expression system, a host cell, or a transgenic plant are also disclosed. Another aspect of the present invention relates to a method of imparting pathogen resistance to plants by transforming a plant with the DNA mol. of the present invention.

IC ICM C12N015-29
ICS C12N015-82; A01H004-00; A01H005-00
NCL 800205000
CC 11-5 (Plant Biochemistry)
Section cross-reference(s): 3, 6, 10
ST hypersensitive response elicitor gene hrpN sequence **Erwinia**
IT Capsicum annuum
Chicory (Cichorium intybus)
Pelargonium hortorum
Petunia hybrida
Saintpaulia ionantha
Squash (Cucurbita maxima)
Tobacco (Nicotiana tabacum xanthi)
Tomato
Zinnia elegans
(elicitation of necrosis in; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT Gene, microbial
RL: BPN (Biosynthetic preparation); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(hrpN; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT Disease resistance, **plant**
Molecular cloning
Pectobacterium chrysanthemi

(hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT DNA sequences
(of gene hrpN encoding hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT **Protein** sequences
(of hypersensitive response **elicitor** from **Erwinia** chrysanthemi)
IT Transformation, genetic
(pathogen resistance; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT Hormones, microbial
RL: BPN (Biosynthetic preparation); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(phytoalexin-eliciting; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT Dicotyledon (Magnoliopsida)
Monocotyledon (Liliopsida)
Plant (Embryophyta)
(**transgenic**; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT 186711-41-1P
RL: BPN (Biosynthetic preparation); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(amino acid sequence; hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT 151438-54-9P, Harpin
RL: BPN (Biosynthetic preparation); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(hypersensitive response elicitor from **Erwinia** chrysanthemi)
IT 186711-42-2P 218280-75-2P
RL: BPN (Biosynthetic preparation); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(nucleotide sequence; hypersensitive response elicitor from **Erwinia** chrysanthemi)
REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L19 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 1998:795045 HCAPLUS
DOCUMENT NUMBER: 130:49943
TITLE: Hypersensitive response **elicitor** **protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease
INVENTOR(S): Laby, Ronald J.; Wei, Zhong-min; Beer, Steven V.
PATENT ASSIGNEE(S): Cornell Research Foundation, Inc., USA; Eden Bioscience Corporation
SOURCE: PCT Int. Appl., 94 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9854214	A2	19981203	WO 1998-US10874	19980528
WO 9854214	A3	19990304		

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG,

KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES,
FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI,
CM, GA, GN, ML, MR, NE, SN, TD, TG

AU 9877004	A1	19981230	AU 1998-77004	19980528
AU 750732	B2	20020725		
EP 996729	A2	20000503	EP 1998-924950	19980528
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
BR 9809699	A	20000711	BR 1998-9699	19980528
US 2001011380	A1	20010802	US 1998-86118	19980528
JP 2002501388	T2	20020115	JP 1999-500902	19980528
FI 9902545	A	20000128	FI 1999-2545	19991129

PRIORITY APPLN. INFO.: US 1997-48109P P 19970530
WO 1998-US10874 W 19980528

AB The present invention is directed to isolated fragments of an Erwinia hypersensitive response elicitor protein, such as harpin, which elicit a hypersensitive response in plants. Also disclosed are isolated DNA mols. which encode the Erwinia hypersensitive response-eliciting fragments. The fragments and DNA mols. that encode them can be used to impart disease resistance to plants, to enhance plant growth, and/or to control insects on plants. This can be achieved by applying the hypersensitive response-eliciting fragments in a non-infectious form to plants or plant seeds. Alternatively, transgenic plants or plant seeds transformed with an hypersensitive response-eliciting fragment-encoding DNA mol. can be employed. Thus, N-terminal, C-terminal and internal fragments of E. amylovora harpin which induced the hypersensitive response in tobacco and protected tobacco from TMV were identified.

IC ICM C07K014-00
CC 11-5 (Plant Biochemistry)
ST **plant** growth disease insect resistance harpin peptide;
Erwinia hypersensitive response eliciting peptide
transgenic plant seed
IT Disease resistance, **plant**
Erwinia
Erwinia amylovora
Growth and development, **plant**
Insect (Insecta)
Pantoea stewartii stewartii
Pectobacterium carotovorum
Pectobacterium chrysanthemi
(hypersensitive response **elicitor protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease)
IT **Proteins**, specific or class
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(hypersensitive response-eliciting; hypersensitive response **elicitor protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease)
IT Protein sequences
(of hypersensitive response-eliciting fragments of harpin of **Erwinia** amylovora)
IT Alfalfa (Medicago sativa)
Apple
Arabidopsis thaliana
Barley
Bean (Phaseolus vulgaris)

Beet
Broccoli
Brussels sprout
Cabbage
Capsicum
Carnation (Dianthus)
Carrot
Cauliflower
Celery (Apium graveolens)
Chicory (Cichorium intybus)
Chrysanthemum
Citrus
Corn
Cotton
Cucumber (Cucumis sativus)
Eggplant (Solanum melongena)
Endive (Cichorium endivia)
Garlic (Allium sativum)
Grape
Lettuce (Lactuca sativa)
Melon (**plant**)
Onion (Allium cepa)
Parsnip
Pea
Peanut (Arachis hypogaea)
Pear (Pyrus communis)
Pelargonium
Petunia
Pineapple (Ananas comosus)
Plant (Embryophyta)
Poinsettia
Potato (Solanum tuberosum)
Radish (Raphanus sativus)
Raspberry
Rice (Oryza sativa)
Rye
Saintpaulia
Seed
Sorghum
Soybean (Glycine max)
Spinach (Spinacia oleracea)
Squash (Cucurbita)
Squash (Cucurbita pepo melopepo)
Strawberry
Sugarcane
Sunflower
Sweet potato
Tobacco
Tomato
Turnip
Wheat
Zinnia
(**transgenic**; hypersensitive response **elicitor protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease)

IT 217307-65-8, 105-403-Harpin (**Erwinia** amylovora) 217307-66-9, 1-98-Harpin (**Erwinia** amylovora) 217307-67-0, 1-104-Harpin (**Erwinia** amylovora) 217307-68-1, 1-122-Harpin (**Erwinia** amylovora) 217307-69-2, 1-168-Harpin (**Erwinia** amylovora) 217307-70-5, 1-218-Harpin (**Erwinia** amylovora) 217307-71-6,

1-266-Harpin (**Erwinia** amylovora) 217307-72-7, 1-342-Harpin (**Erwinia** amylovora) 217307-73-8, 1-321-Harpin (**Erwinia** amylovora) 217307-74-9, 1-372-Harpin (**Erwinia** amylovora) 217307-75-0, 76-209-Harpin (**Erwinia** amylovora) 217307-76-1, 105-209-Harpin (**Erwinia** amylovora) 217307-77-2, 99-209-Harpin (**Erwinia** amylovora) 217307-78-3, 109-204-Harpin (**Erwinia** amylovora) 217307-79-4, 109-200-Harpin (**Erwinia** amylovora) 217307-80-7, 105-180-Harpin (**Erwinia** amylovora) 217434-84-9, 137-204-Harpin (**Erwinia** amylovora) 217434-86-1, 137-200-Harpin (**Erwinia** amylovora)
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(amino acid sequence; hypersensitive response **elicitor** **protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease)

IT 217434-96-3
RL: AGR (Agricultural use); BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(harpin **peptide**; hypersensitive response **elicitor** **protein** fragments and their use to enhance **plant** growth and protect **plants** from insects and disease)

L19 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 1998:29437 HCAPLUS
DOCUMENT NUMBER: 128:125913
TITLE: **Phytophthora** resistance through production of a fungal **protein elicitor** (.beta.-cryptogein) in tobacco
AUTHOR(S): Tepfer, David; Boutteaux, Catherine; Vigon, Catherine; Aymes, Sylvie; Perez, Valerie; O'Donohue, Michael J.; Huet, Jean-Claude; Pernollet, Jean-Claude
CORPORATE SOURCE: Biol. de la Rhizosphere, INRA, Versailles, F-78026, Fr.
SOURCE: Molecular Plant-Microbe Interactions (1998), 11(1), 64-67
CODEN: MPMIEL; ISSN: 0894-0282
PUBLISHER: APS Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Transformation of tobacco with a gene encoding the fungal elicitor protein .beta.-cryptogein resulted in resistance to the pathogen Phytophthora parasitica var. nicotianae. Resistance was improved when the foreign gene was in the hemizygous state, and a single amino acid substitution that reduced the necrotic effects of the protein also conferred some resistance.
CC 11-5 (Plant Biochemistry)
Section cross-reference(s): 10
ST cryptogein **Phytophthora** resistance tobacco
IT Disease resistance, **plant**
Phytophthora nicotianae
Transformation, genetic
(**Phytophthora** resistance through prodn. of a fungal **protein elicitor** (.beta.-cryptogein) in tobacco)
IT Tobacco
(**transgenic**; **Phytophthora** resistance through prodn. of a fungal **protein elicitor** (.beta.-cryptogein) in tobacco)
IT 115742-70-6, .beta.-Cryptogein

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study)
(**Phytophthora** resistance through prodn. of a fungal **protein elicitor** (.beta.-cryptogein) in tobacco)

L19 ANSWER 9 OF 9 HCAPLUS COPYRIGHT 2003 ACS
ACCESSION NUMBER: 1997:502748 HCAPLUS
DOCUMENT NUMBER: 127:119655
TITLE: Cloning of cDNA for glucan elicitor receptor of soybean and use for preparation of **transgenic plants** resistant to fungi
INVENTOR(S): Kakitani, Makoto; Umemoto, Naoyuki; Ishida, Isao; Yamaoka, Naoto
PATENT ASSIGNEE(S): Kirin Beer Kabushiki Kaisha, Japan; Kakitani, Makoto; Umemoto, Naoyuki; Ishida, Isao; Yamaoka, Naoto
SOURCE: PCT Int. Appl., 90 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9722242	A1	19970626	WO 1996-JP3653	19961213
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9711110	A1	19970714	AU 1997-11110	19961213
EP 879554	A1	19981125	EP 1996-941871	19961213
R: AT, BE, CH, DE, ES, FR, GB, IT, NL, SE				
CN 1209038	A	19990224	CN 1996-199945	19961213
US 6225531	B1	20010501	US 1998-94557	19980615

PRIORITY APPLN. INFO.:
JP 1995-347823 A 19951215
JP 1994-136100 A 19940617
WO 1996-JP3653 W 19961213
US 1997-591566 B2 19970714

AB The cDNA encoding a glucan elicitor receptor was isolated from soybean and its amino acid sequence (667 amino acids) deduced. A process for producing a plant resistant to pathogenic fungi by expression of the cDNA sequence in plants such as tobacco was shown. The resistance to pathogenic fungi was further enhanced by introducing the cDNA encoding glycanase of soybean into the tobacco plant.
IC ICM A01H005-00
ICS C12N015-29
CC 11-1 (Plant Biochemistry)
Section cross-reference(s): 3
ST soybean glucan elicitor receptor cDNA sequence; fungi resistance **transgenic plant** glycanase; tobacco fungi resistance
IT cDNA sequences
(for glucan elicitor receptor and glycanase; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)
IT Gene, **plant**
RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological

study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)
(for glucan elicitor receptor and glycanase; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT Receptors
RL: AGR (Agricultural use); PRP (Properties); BIOL (Biological study); USES (Uses)
(glucan elicitor; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT **Protein** sequences
(of glucan **elicitor** receptor and glycanase; cloning of cDNA for glucan **elicitor** receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT Fungi
Phytophthora
Phytophthora nicotianae
Rhizoctonia
Rhizoctonia solani
(resistance to; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT Legume (Fabaceae)
Plant (Embryophyta)
Solanaceae
Tobacco
(**transgenic**; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT 130175-92-7
RL: AGR (Agricultural use); CAT (Catalyst use); BIOL (Biological study); USES (Uses)
(amino acid sequence; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT 173968-82-6, Receptor, glucan elicitor (soybean)
RL: AGR (Agricultural use); PRP (Properties); BIOL (Biological study); USES (Uses)
(amino acid sequence; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT 130173-29-4, DNA (soybean clone pEG488 endo-1,3-.beta.-glucanase cDNA)
RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)
(cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT 173968-81-5
RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)
(nucleotide sequence; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of **transgenic plants** resistant to fungi)

IT 9025-37-0, Glucanase, endo-1,3-.beta.-
RL: AGR (Agricultural use); CAT (Catalyst use); BIOL (Biological study); USES (Uses)
(**plant** resistance to fungi enhanced by; cloning of cDNA for glucan elicitor receptor of soybean and use for prepn. of

transgenic plants resistant to fungi)

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=> fil biosis
FILE 'BIOSIS' ENTERED AT 12:12:42 ON 27 JAN 2003
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FILE COVERS 1969 TO DATE.
CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT
FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 22 January 2003 (20030122/ED)


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     (FILE 'BIOSIS' ENTERED AT 12:08:39 ON 27 JAN 2003)
                DEL HIS Y
L1            950 S ELICITOR# (S) (PROTEIN# OR ?PEPTIDE?)
L2          95794 S DESSICCAT? OR DESICCAT? OR LONGEV? OR  POSTHARVEST? OR HARVES
L3              5 S L1 AND L2
L4          97762 S CLAVIBACTER OR ERWINIA OR PHYTOPHTHORA OR PSEUDOMONAS OR RALS
L5            265 S L4 AND L1
L6            232 S L5 AND PLANT#
L7          79764 S TRANSGEN? OR CUTTING?
L8             18 S L7 AND L6
L9             18 S L8 NOT L3
L10            17 S HYPERSENSITIVE RESPONSE ELICITOR#
L11            15 S L10 AND (L2 OR L7 OR L4)
L12             0 S L11 NOT (L10 OR L3)

     FILE 'BIOSIS' ENTERED AT 12:12:42 ON 27 JAN 2003

=> d bib ab ct l3 1-5;d bib ab ct l11 1-15

L3   ANSWER 1 OF 5  BIOSIS  COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN   2000:502322  BIOSIS
DN   PREV200000502322
TI   Chitinase activity in tall fescue seedlings as affected by cultivar,
     seedling development, and ethephon.
AU   Marek, S. M.; Roberts, C. A. (1); Karr, A. L.; Sleper, D. A.
CS   (1) Dep. of Agronomy, Univ. of Missouri, Columbia, MO, 65211 USA
SO   Crop Science, (March April, 2000) Vol. 40, No. 3, pp. 713-716. print.
     ISSN: 0011-183X.
DT   Article
LA   English
SL   English
AB   Recent reports indicate that tall fescue (Festuca arundinacea Schreb.) may
     be selected for increased disease resistance with the use of a marker such
     as chitinase, a defense protein associated with disease
     resistance in tall fescue. The objective of this study was to determine if
     chitinase activity in tall fescue cultivars differs consistently across
     seedling stage, and to determine if chitinase activity could be increased
     with ethephon ((2-chloroethyl)phosphonic acid), a growth regulator used as
     a chemical elicitor. Ten cultivars of tall fescue were planted
     in a greenhouse, and seedlings were harvested at 14, 28, and 42
     d after germination. Seedlings were treated with and without ethephon 3 d
     prior to each harvest. Foliage was analyzed for total and
     specific chitinase activity. Both total and specific chitinase activity
     differed (P < 0.01) among cultivars and seedling stages. Highest ranking
     cultivars expressed at least 16% more total chitinase activity and 18%
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more specific activity than the lowest ranking cultivars. Though chitinase activity changed drastically over seedling development, there were no cultivar X seedling stage interactions ($P < 0.01$) for total or specific activity. Ethephon increased total and specific activity only at the 0.06 and 0.07 probability level and was far less effective than biological **elicitors** used to increase chitinase in previous studies. We concluded that chitinase could serve as a consistent marker among tall fescue cultivars across seedling stages, but a more effective chemical **elicitor** would be desirable to increase chitinase activity.

IT Major Concepts
Agronomy (Agriculture); Enzymology (Biochemistry and Molecular Biophysics)

IT Chemicals & Biochemicals
chitinase; ethephon

L3 ANSWER 2 OF 5 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2000:256324 BIOSIS
DN PREV200000256324
TI Early events during quiescent infection development by Colletotrichum gloeosporioides in unripe avocado fruits.
AU Beno-Moualem, D.; Prusky, D. (1)
CS (1) Department of Postharvest Science of Fresh Produce, Agricultural Research Organization, Volcani Center, Bet Dagan, 50250 Israel
SO Phytopathology, (May, 2000) Vol. 90, No. 5, pp. 553-559. print..
ISSN: 0031-949X.
DT Article
LA English
SL English
AB Inoculation of avocado pericarp tissue with Colletotrichum gloeosporioides and treatment of avocado cell cultures with the cell wall **elicitor** of C. gloeosporioides both increased the production of reactive oxygen species (ROS). However, whereas the production of ROS could be detected within minutes in avocado cell suspensions, it was detected only after 2 h following inoculation of pericarp tissue. **Protein** kinase inhibitors such as K-252a and staurosporine and the phosphatase inhibitor microcystin-LR inhibited the release of H_2O_2 from avocado cell suspensions. When 1 mM H_2O_2 was exogenously applied to pericarp tissue, it enhanced ROS, phenylalanine ammonia lyase (PAL) activity, and epicatechin levels. But, when H_2O_2 treatment was applied following staurosporine treatment, PAL activity was no longer induced. The uninduced ROS production in pericarp tissue of freshly **harvested**, unripe, resistant fruit was twice as high as in ripe, susceptible fruit. Challenge inoculation of resistant fruit further increased the ROS level; however, this increase did not occur in susceptible fruits. The current findings are consistent with the hypothesis that production of ROS is induced by fungal infection of unripe fruits and, consequently, may modulate resistance, resulting in the inhibition of fungal development and quiescence.

IT Major Concepts
Horticulture (Agriculture); Infection; Pest Assessment Control and Management

IT Parts, Structures, & Systems of Organisms
fruit: reproductive system, unripe status

L3 ANSWER 3 OF 5 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:34705 BIOSIS
DN PREV199900034705
TI Differential induction of **proteins** in orange flavedo by biologically based **elicitors** and challenged by Penicillium digitatum Sacc.

AU Fajardo, J. E.; McCollum, T. G.; McDonald, R. E.; Mayer, R. T.
CS U.S. Horticultural Res. Lab., Agricultural Res. Service, U.S. Dep. Agriculture, 2120 Camden Road, Orlando, FL 32803-1419 USA
SO Biological Control, (Nov., 1998) Vol. 13, No. 3, pp. 143-151. ISSN: 1049-9644.
DT Article
LA English
AB The effects of biologically based inducing agents (**elicitors**) applied singly or in combination to **harvested** oranges were investigated for enhancing host resistance to green mold. Oranges (Citrus sinensis cv. 'Valencia') treated with inducing agents and challenged by the green mold pathogen (Penicillium digitatum) showed a delay in the onset and progression of disease symptoms compared with inoculated fruits not treated with the **elicitors**. Chitosan (a preparation of ground crab shells), Margosan-O (an oil-based plant-derived product from neem seed) + Aspire (a water dispersible granule containing an antagonistic yeast), Aspire, and chitosan + Aspire reduced fruit decay 38, 41, 42, and 44%, respectively. The inducing agents reduced disease incidence but not disease severity. Application of **elicitors** followed by inoculation with P. digitatum and P. digitatum infection alone increased total soluble **proteins** in the flavedo (the tissue that forms the outer colored rind) twofold relative to the untreated control. The flavedo is an important tissue that is vulnerable to **postharvest** diseases especially at storage and transport of the **harvested** crop. No apparent qualitative differences were visualized in **protein** patterns analyzed by SDS-PAGE of all treatments across all days of incubation. A temporal differential induction of chitinase, beta-1,3-glucanase, and peroxidase was demonstrated as a result of **elicitor** application followed by challenge inoculation with P. digitatum. Induction of these enzymes was corroborated by immunodetection. Lysozyme and a polygalacturonase-inhibiting **protein** were detected at low activity levels. However, the defensive **proteins** appeared to be constitutive and slightly induced but did not involve the de novo synthesis of novel **proteins**.
IT Major Concepts
Horticulture (Agriculture)
IT Chemicals & Biochemicals
proteins

L3 ANSWER 4 OF 5 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1997:71165 BIOSIS
DN PREV199799370368
TI Phycocyanin, a new elicitor for capsaicin and anthocyanin accumulation in plant cell cultures.
AU Rao, S. Ramachandra; Sarada, R.; Ravishankar, G. A. (1)
CS (1) Plant Cell Biotechnol. Dep., Central Food Technological Research Inst., Mysore-570 013 India
SO Applied Microbiology and Biotechnology, (1996) Vol. 46, No. 5-6, pp. 619-621. ISSN: 0175-7598.
DT Article
LA English
AB **Elicitors** of both fungal and bacterial origin that is, polysaccharides, **proteins** and fatty acids, are widely used for enhancement of secondary metabolites in plant cell cultures. In the present study, phycocyanin a natural blue pigment that is the major light-**harvesting** biliprotein in the blue-green alga Spirulina platensis was used as an **elicitor** to enhance the accumulation of capsaicin and anthocyanin in Capsicum frutescens and Daucus carota cell cultures

respectively. Phycocyanin at 0.3, 0.6 and 1.2 mg% in capsicum cell cultures elicited a more than two-fold increase in capsaicin content with maximum productivity of 192 mu-g/g fresh weight. Similarly in Daucus carota cell cultures a two-fold increase in anthocyanin content was obtained at 0.3 mg% with a maximum productivity of 24.8 mg% on a dry-weight basis. In both the systems, phycocyanin showed an early elicitation of secondary metabolites.

IT Major Concepts
Cell Biology; Metabolism; Methods and Techniques

IT Chemicals & Biochemicals
CAPSAICIN

L3 ANSWER 5 OF 5 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1995:227320 BIOSIS
DN PREV199598241620
TI Changes in protein methylation associated with the elicitation response in cell cultures of alfalfa (Medicago sativa L.
AU Daniell, Timothy; Edwards, Robert
CS Dep. Biol. Sci., Univ. Durham, Durham DH1 3LE UK
SO FEBS Letters, (1995) Vol. 360, No. 1, pp. 57-61.
ISSN: 0014-5793.
DT Article
LA English
AB The methylation of endogenous **proteins** increased in alfalfa cell suspension cultures following treatment with a fungal **elicitor**. Carboxyl methylation, a post-translational modification associated with controlling the localisation and **longevity** of **proteins** , was the dominant form of **protein** methylation in both elicited and unelicited cells. **Protein** methylation was restricted to a limited number of **peptides** prior to **elicitor** treatment but as elicitation progressed the number of endogenous substrates increased. Increases resulted from a combination of an **elicitor** -dependent increase in the activity of a **protein** carboxyl methyltransferase and the accumulation of preferred endogenous substrates in the latter stages of elicitation.

IT Major Concepts
Biochemistry and Molecular Biophysics; Cell Biology; Enzymology (Biochemistry and Molecular Biophysics); Metabolism

IT Chemicals & Biochemicals
METHYLTRANSFERASE

L11 ANSWER 1 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2002:420773 BIOSIS
DN PREV200200420773
TI Effects of Messenger(R) on disease resistance and plant growth enhancement in strawberry and cucumber.
AU Qiu, D. (1); Clayton, K. (1); Wei, Z.-M. (1)
CS (1) EDEN Bioscience Corporation, Bothell, WA USA
SO Phytopathology, (June, 2002) Vol. 92, No. 6 Supplement, pp. S67. print.
Meeting Info.: 2002 Annual Meeting of the American Phytopathological Society Milwaukee, WI, USA July 27-31, 2002
ISSN: 0031-949X.
DT Conference
LA English
AB Messenger is a biopesticide containing 3% active ingredient harpin protein. Harpin is a proteinaceous **hypersensitive response elicitor** isolated from **Erwinia**

amylovora. Previous studies have indicated that when applied to plants, the harpin protein is recognized and triggers a complex set of signaling pathways that contribute to an overall acquired disease resistance in the plant. Plants treated with Messenger also demonstrate an increase in yield and a general plant growth enhancement effect. In recent studies, strawberry plants (Diamonte) were treated with Messenger at rates of 0, 1, 5, 10, 20, 40, 80 and 120 mg/ml. After Messenger treatment, the plants were inoculated with powdery mildew (Sphaerotheca macularis f. sp. Fragariae) or Xanthmonas fragariae. Disease resistance was determined by using a disease severity index. Messenger spray treatments substantially induced resistance in strawberries against strawberry powdery mildew and **Xanthomonas** fragariae. In separate studies, treatments of 10-40 mg/ml Messenger were shown to be sufficient to induce increases, over control plants, of 10 to 13% with respect to cucumber (Park's All Season Burpless) plants height and seedling dry weight; as well as strawberry plants height and leaf number.

IT Major Concepts
Horticulture (Agriculture); Pest Assessment Control and Management

IT Chemicals & Biochemicals
Messenger: biopesticide, disease resistance, hypersensitive response, pesticide, plant growth enhancement; harpin protein: **hypersensitive response elicitor**

L11 ANSWER 2 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2002:135120 BIOSIS
DN PREV200200135120
TI Use of **hypersensitive response elicitor** protein or polypeptide from **Clavibacter** michiganensis for disease resistance, growth enhancement and insect control.
AU Beer, Steven V.; Butler, Jerry L. (1)
CS (1) Woodinville, WA USA
ASSIGNEE: Cornell Research Foundation, Inc.; Eden Bioscience Corporation, Bothell, WA, USA
PI US 6333302 December 25, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (Dec. 25, 2001) Vol. 1253, No. 4, pp. No Pagination. http://www.uspto.gov/web/menu/patdata.html. e-file. ISSN: 0098-1133.
DT Patent
LA English
AB The present invention is directed to the use of a protein or polypeptide from Gram positive bacteria, such as **Clavibacter** michiganensis subsp. sepedonicus, which elicits a hypersensitive response in plants. This protein or polypeptide can used to impart disease resistance to plants, to enhance plant growth, and/or to control insects on plants. This can be achieved by applying the **hypersensitive response elicitor** protein or polypeptide in a non-infectious form to plants or plant seeds under conditions where the protein or polypeptide contacts the cells of the plant or the plant seed and is effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds.

IT Major Concepts
Agrichemicals

IT Parts, Structures, & Systems of Organisms
seeds

IT Chemicals & Biochemicals
hypersensitive response elicitor polypeptide; **hypersensitive response elicitor** protein

L11 ANSWER 3 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:528585 BIOSIS
DN PREV200100528585
TI Hypersensitive response induced resistance in plants by seed treatment with a **hypersensitive response elicitor**.
AU Qiu, Dewen; Wei, Zhong-Min; Beer, Steven V.
ASSIGNEE: Cornell Research Foundation, Inc.
PI US 6235974 May 22, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (May 22, 2001) Vol. 1246, No. 4, pp. No Pagination. e-file.
ISSN: 0098-1133.
DT Patent
LA English
AB The present invention relates to a method of imparting pathogen resistance to plants. This involves applying a **hypersensitive response elicitor** polypeptide or protein in a non-infectious form to a plant seed under conditions where the polypeptide or protein contacts cells of the plant seed. The present invention is also directed to a pathogen resistance imparting plant seed. Alternatively, **transgenic** plant seeds containing a DNA molecule encoding a **hypersensitive response elicitor** polypeptide or protein can be planted in soil and a plant can be propagated from the planted seed under conditions effective to impart pathogen resistance to the plant.
IT Major Concepts
Immune System (Chemical Coordination and Homeostasis); Infection; Methods and Techniques
IT Chemicals & Biochemicals
DNA; **hypersensitive response elicitor** polypeptide

L11 ANSWER 4 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:502755 BIOSIS
DN PREV200100502755
TI **Hypersensitive response elicitor** from **Erwinia** amylovora, its use, and encoding gene.
AU Bogdanove, Adam J. (1); Kim, Jihyun Francis; Wei, Zhong-Min; Beer, Steven V.
CS (1) Ithaca, NY USA
ASSIGNEE: Cornell Research Foundation, Inc.
PI US 6228644 May 08, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (May 8, 2001) Vol. 1246, No. 2, pp. No Pagination. e-file.
ISSN: 0098-1133.
DT Patent
LA English
AB The present invention is directed to an isolated protein or polypeptide which elicits a hypersensitive response in plants as well as an isolated DNA molecule which encodes the hypersensitive response eliciting protein or polypeptide. This isolated protein or polypeptide and the isolated DNA molecule can used to impart disease resistance to plants, to enhance plant growth, and/or to control insects on plants. This can be achieved by applying the **hypersensitive response elicitor** protein or polypeptide in a non-infectious form to plants or plant seeds under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds. Alternatively, **transgenic** plants or plant seeds transformed with a DNA molecule encoding a **hypersensitive response elicitor** protein or polypeptide can be provided and the **transgenic** plants or plants resulting from the

transgenic plant seeds are grown under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds.

IT Major Concepts
Horticulture (Agriculture); Infection; Molecular Genetics (Biochemistry and Molecular Biophysics); Pest Assessment Control and Management

IT Chemicals & Biochemicals
DNA: encoding gene; hypersensitive response eliciting protein: from **Erwinia** amylovora

L11 ANSWER 5 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:477350 BIOSIS
DN PREV200100477350
TI Enhancement of growth in plants.
AU Qiu, Dewen (1); Wei, Zhong-Min; Beer, Steven V.
CS (1) Seattle, WA USA
ASSIGNEE: Cornell Research Foundation, Inc.
PI US 6277814 August 21, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (Aug. 21, 2001) Vol. 1249, No. 3, pp. No Pagination. e-file.
ISSN: 0098-1133.
DT Patent
LA English
AB The present invention relates to a method of enhancing growth of plants. This involves applying a **hypersensitive response elicitor** polypeptide or protein in a non-infectious form to a plant or plant seed under conditions effective to enhance growth of the plant or plants produced from the plant seed. Alternatively, **transgenic** plants or **transgenic** plant seeds transformed with a DNA molecule encoding a **hypersensitive response elicitor** polypeptide or protein can be provided and the **transgenic** plants or plants resulting from the **transgenic** plant seeds are grown under conditions effective to enhance plant growth.

IT Major Concepts
Methods and Techniques

IT Chemicals & Biochemicals
elicitor polypeptide

L11 ANSWER 6 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:423743 BIOSIS
DN PREV200100423743
TI **Hypersensitive response elicitor** from **Erwinia** amylovora and its use.
AU Kim, Jihyun Francis (1); Beer, Steven V.
CS (1) Ithaca, NY USA
ASSIGNEE: Cornell Research Foundation, Inc.
PI US 6262018 July 17, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (July 17, 2001) Vol. 1248, No. 3, pp. No Pagination. e-file.
ISSN: 0098-1133.
DT Patent
LA English
AB The present invention is directed to an isolated protein or polypeptide which elicits a hypersensitive response in plants as well as an isolated DNA molecule which encodes the hypersensitive response eliciting protein or polypeptide. This isolated protein or polypeptide and the isolated DNA molecule can used to impart disease resistance to plants, to enhance plant growth, and/or to control insects on plants. This can be achieved by applying the **hypersensitive response elicitor** protein or polypeptide in a non-infectious form to plants or plant seeds

under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds. Alternatively, **transgenic** plants or plant seeds transformed with a DNA molecule encoding a **hypersensitive response elicitor** protein or polypeptide can be provided and the **transgenic** plants or plants resulting from the **transgenic** plant seeds are grown under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds.

IT Major Concepts
Methods and Techniques; Pest Assessment Control and Management

IT Chemicals & Biochemicals
hypersensitive response elicitor

L11 ANSWER 7 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:333122 BIOSIS
DN PREV200100333122
TI **Hypersensitive response elicitor** from **Pseudomonas** syringae and its use.
AU Collmer, Alan; Charkowski, Amy (1); Alfano, James R.
CS (1) Oakland, CA USA
ASSIGNEE: Cornell Research Foundation, Inc.
PI US 6172184 January 09, 2001
SO Official Gazette of the United States Patent and Trademark Office Patents, (Jan. 9, 2001) Vol. 1242, No. 2, pp. No Pagination. e-file. ISSN: 0098-1133.
DT Patent
LA English
AB The present invention is directed to an isolated protein or polypeptide which elicits a hypersensitive response in plants as well as an isolated DNA molecule which encodes the hypersensitive response eliciting protein or polypeptide. This isolated protein or polypeptide and the isolated DNA molecule can used to impart disease resistance to plants, to enhance plant growth, and/or to control insects on plants. This can be achieved by applying the **hypersensitive response elicitor** protein or polypeptide in a non-infectious form to plants or plant seeds under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds. Alternatively, **transgenic** plants or plant seeds transformed with a DNA molecule encoding a **hypersensitive response elicitor** protein or polypeptide can be provided and the **transgenic** plants or plants resulting from the **transgenic** plant seeds are grown under conditions effective to impart disease resistance, to enhance plant growth, and/or to control insects on plants or plants grown from the plant seeds.
IT Major Concepts
Agronomy (Agriculture)
IT Chemicals & Biochemicals
polypeptide: hypersensitive response, isolation; protein: hypersensitive response, isolation

L11 ANSWER 8 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:302811 BIOSIS
DN PREV200100302811
TI Harpin, a **hypersensitive response elicitor** from **Erwinia** amylovora, regulates ion channel activities in Arabidopsis thaliana suspension cells.
AU El-Maarouf, Hayat; Barny, Marie Anne; Rona, Jean Pierre; Bouteau, Francois (1)
CS (1) Laboratoire d'Electrophysiologie des Membranes, Universite Paris 7, 2

Place Jussieu, 75251, Paris Cedex 05: bouteau@ccr.jussieu.fr France
SO FEBS Letters, (25 May, 2001) Vol. 497, No. 2-3, pp. 82-84. print.
ISSN: 0014-5793.
DT Article
LA English
SL English
AB HrpN, the **hypersensitive response elicitor** from **Erwinia** amylovora, stimulated K+ outward rectifying currents in Arabidopsis thaliana suspension cells. It also decreased anion currents. These data demonstrate the ability of harpin to regulate different plasma membrane ion channels, putative components of signal transduction chains leading to defense responses and programmed cell death.
IT Major Concepts
Biochemistry and Molecular Biophysics; Membranes (Cell Biology)
IT Parts, Structures, & Systems of Organisms
plasma membrane
IT Chemicals & Biochemicals
harpin: **hypersensitive response elicitor;**
ion channels; potassium ion: outward rectifying currents

L11 ANSWER 9 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2001:292735 BIOSIS
DN PREV200100292735
TI Disruption of microtubular cytoskeleton induced by cryptogein, an elicitor of hypersensitive response in tobacco cells.
AU Binet, Marie-Noelle (1); Humbert, Claude; Lecourieux, David; Vantard, Marylin; Pugin, Alain
CS (1) Biochimie, Biologie Cellulaire et Ecologie des Interactions Plantes/Micro-Organismes, Unite Mixte de Recherche, Institut National de la Recherche Agronomique, Universite de Bourgogne, 17 Rue Sully, BV 86510, 21065, Dijon Cedex: binet@dijon.inra.fr France
SO Plant Physiology (Rockville), (February, 2001) Vol. 125, No. 2, pp. 564-572. print.
ISSN: 0032-0889.
DT Article
LA English
SL English
AB The dynamics of microtubular cytoskeleton were studied in tobacco (Nicotiana tabacum cv Xanthi) cells in response to two different plant defense elicitors: cryptogein, a protein secreted by **Phytophthora** cryptogea and oligogalacturonides (OGs), derived from the plant cell wall. In tobacco plants cryptogein triggers a hypersensitive-like response and induces systemic resistance against a broad spectrum of pathogens, whereas OGs induce defense responses, but fail to trigger cell death. The comparison of the microtubule (MT) dynamics in response to cryptogein and OGs in tobacco cells indicates that MTs appear unaffected in OG-treated cells, whereas cryptogein treatment caused a rapid and severe disruption of microtubular network. When hyperstabilized by the MT depolymerization inhibitor, taxol, the MT network was still disrupted by cryptogein treatment. On the other hand, the MT-depolymerizing agent oryzalin and cryptogein had different and complementary effects. In addition to MT destabilization, cryptogein induced the death of tobacco cells, whereas OG-treated cells did not die. We demonstrated that MT destabilization and cell death induced by cryptogein depend on calcium influx and that MT destabilization occurs independently of active oxygen species production. The molecular basis of cryptogein-induced MT disruption and its potential significance with respect to cell death are discussed.
IT Major Concepts
Cell Biology; Infection

IT Parts, Structures, & Systems of Organisms
microtubules: cytoskeleton
IT Chemicals & Biochemicals
cryptogein: **hypersensitive response elicitor**

L11 ANSWER 10 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 2000:277636 BIOSIS
DN PREV200000277636
TI Insect control with a **hypersensitive response elicitor.**
AU Zitter, Thomas A. (1); Wei, Zhong-Min
CS (1) Kirkland, WA USA
ASSIGNEE: Cornell Research Foundation, Inc., Ithaca, NY, USA; EDEN Bioscience, Bothell, WA, USA
PI US 5977060 November 02, 1999
SO Official Gazette of the United States Patent and Trademark Office Patents, (Nov. 2, 1999) Vol. 1228, No. 1, pp. No pagination. e-file.
ISSN: 0098-1133.
DT Patent
LA English
AB The present invention relates to a method of controlling insects on plants. This involves applying a **hypersensitive response elicitor** polypeptide or protein in a non-infectious form to a plant or plant seed under conditions effective to control insects on the plant or plants produced from the plant seed. Alternatively, **transgenic** plants or **transgenic** plant seeds transformed with a DNA molecule encoding a **hypersensitive response elicitor** polypeptide or protein can be provided and the **transgenic** plants or plants resulting from the **transgenic** plant seeds are grown under conditions effective to control insects.
IT Major Concepts
Biochemistry and Molecular Biophysics; Pesticides
IT Chemicals & Biochemicals
hypersensitive response elicitor polypeptide

L11 ANSWER 11 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1999:72154 BIOSIS
DN PREV199900072154
TI **Hypersensitive response elicitor** from **Erwinia** chrysanthemi.
AU Bauer, D.; Collmer, A.
CS Ithaca, N.Y. USA
ASSIGNEE: CORNELL RESEARCH FOUNDATION, INC.
PI US 5850015 Dec. 15, 1998
SO Official Gazette of the United States Patent and Trademark Office Patents, (Dec. 15, 1998) Vol. 1217, No. 3, pp. 2676.
ISSN: 0098-1133.
DT Patent
LA English
IT Major Concepts
Biochemistry and Molecular Biophysics; Genetics; Infection; Pathology

L11 ANSWER 12 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1998:473400 BIOSIS
DN PREV199800473400
TI Global regulation by the small RNA-binding protein CsrA and the non-coding RNA molecule CsrB.
AU Romeo, Tony (1)

CS (1) Dep. Mol. Biol. Immunol., Univ. North Tex. Health Sci. Cent. at Fort Worth, 3500 Camp Bowie Blvd., Fort Worth, TX 76107-2699 USA
SO Molecular Microbiology, (Sept., 1998) Vol. 29, No. 6, pp. 1321-1330. ISSN: 0950-382X.
DT Article
LA English
AB Csr (carbon storage regulator) is a recently discovered global regulatory system that controls bacterial gene expression post-transcriptionally. Its effector is a small RNA-binding protein referred to as CsrA or, in phytopathogenic **Erwinia** species, RsmA (repressor of stationary phase metabolites). Numerous genes whose expression occurs in the stationary phase of growth are repressed by csrA/rsmA, and csrA activates certain exponential-phase metabolic pathways. Glycogen synthesis and catabolism, gluconeogenesis, glycolysis, motility, cell surface properties and adherence are modulated by csrA in Escherichia coli, while the production of several secreted virulence factors, the plant **hypersensitive response elicitor** HrpNEcc and, potentially, other secondary metabolites are regulated by rsmA in **Erwinia** carotovora. CsrA represses glycogen synthesis by binding to and destabilizing glgCAP mRNA and is hypothesized to repress other genes by a similar mechanism. The second component of the Car system is CsrB (AepH in **Erwinia** species), a noncoding RNA molecule that forms a large globular ribonucleoprotein complex with approximately 18 CsrA subunits and antagonizes the effects of CsrA in vivo. Highly repeated sequence elements found within the loops of predicted stem-loops and other single-stranded segments of CsrB RNA may facilitate CsrA binding. Current information supports a model in which CsrA exists in an equilibrium between CsrB and CsrA-regulated mRNAs, which predicts that CsrB levels may be a key determinant of CsrA activity in the cell. The presence of csrA homologues in phylogenetically diverse species further suggests that this novel kind of regulatory system is likely to play a broad role in modulating eubacterial gene expression.
IT Major Concepts
Bacteriology; Biochemistry and Molecular Biophysics; Molecular Genetics (Biochemistry and Molecular Biophysics)
IT Chemicals & Biochemicals
csrA gene: homologs; glgCAP mRNA [glgCAP messenger RNA]: destabilization; glycogen: catabolism, modulation, synthesis; plant **hypersensitive response elicitor** HrpN-Ecc: production regulation; virulence factors: production regulation; AepH molecule: non-coding RNA molecule; CsrA protein: RNA-binding protein, activity, gene repressor; CsrB molecule: non-coding RNA molecule; RsmA protein: gene repressor

L11 ANSWER 13 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1997:329607 BIOSIS
DN PREV199799628810
TI Treatment of tomato seed with harpin enhances germination and growth and induces resistance to **Ralstonia** solanacearum.
AU Qiu, D.; Wei, Z.-M.; Bauer, D. W.; Beer, S. V.
CS Dep. Plant Pathol., Cornell Univ., Ithaca, NY 14853 USA
SO Phytopathology, (1997) Vol. 87, No. 6 SUPPL., pp. S80.
Meeting Info.: Annual Meeting of the American Phytopathological Society Rochester, New York, USA August 9-13, 1997
ISSN: 0031-949X.
DT Conference; Abstract
LA English
IT Major Concepts
Biochemistry and Molecular Biophysics; Development; Horticulture (Agriculture); Infection; Pathology; Pest Assessment Control and

Management; Physiology

L11 ANSWER 14 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1997:329207 BIOSIS
DN PREV199799628410
TI Effect of harpin on Arabidopsis thaliana.
AU Dong, H.; Bauer, D. W.; Delaney, T. P.; Beer, S. V.
CS Dep. Plant Pathol., Cornell Univ., Ithaca, NY 14853 USA
SO Phytopathology, (1997) Vol. 87, No. 6 SUPPL., pp. S24-S25.
Meeting Info.: Annual Meeting of the American Phytopathological Society
Rochester, New York, USA August 9-13, 1997
ISSN: 0031-949X.
DT Conference; Abstract
LA English
IT Major Concepts
Infection; Pathology

L11 ANSWER 15 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AN 1990:123321 BIOSIS
DN BR38:57531
TI A MODEL FOR THE GENE-FOR-GENE INTERACTION BETWEEN **PSEUDOMONAS** -SYRINGAE AND SOYBEAN.
AU TAMAKI S J; STAYTON M M; KOBAYASHI D
CS CLEARGENE INC., UNIV. CALIF.-RICHMOND FIELD STATION, RICHMOND, CALIF. 94804-4698.
SO ANNUAL MEETING OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY, RICHMOND, VIRGINIA, USA, AUGUST 20-24, 1989. PHYTOPATHOLOGY. (1989) 79 (10), 1144.
CODEN: PHYTAJ. ISSN: 0031-949X.
DT Conference
FS BR; OLD
LA English